Photo: W. H. Evans

NEI TENEMAKIN, THE "OLD QUEEN" OF BANABA

OCEAN ISLAND
AND
NAURU
THEIR STORY

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With Foreword by
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High Commissioner for Australia in Great Britain

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TO

MY FRIENDS IN THE PHOSPHATE INDUSTRY,
PAST AND PRESENT

FOREWORD

With very great pleasure I commend this book to the reading public. So little is known of those romantic islands of the Pacific—Ocean Island and Nauru, that Mr A. F. Ellis is to be congratulated on producing such an absorbing story of their history and development. On those islands, in an atmosphere of supreme contentment and under modern conditions of production, intense industry has opened up and developed the largest high-grade phosphate bearing areas in the world. When it is remembered that the phosphate deposits on Ocean Island and Nauru were not discovered until 1900, and that, to-day, an average of 600,000 tons are shipped overseas annually, some idea can be formed of the immense development of this industry in recent years.

That Mr Ellis has undertaken the task of preparing an authentic record of the discovery and working of the phosphate deposits on Ocean Island and Nauru is, in itself, an assurance that the reader's interest in this book will be sustained until the last page is turned.

Australia House,
London,
17 May 1935.

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AUTHOR'S NOTE

NOWADAYS there is increasing interest in the islands of the Pacific off the beaten track, and none of these have a stranger story than Ocean Island and Nauru. None have done or are doing so much for the outside world as these two lonely dots. The writing of this story, which I undertook with some diffidence at the suggestion of friends in the phosphate industry, has proved to be a labour of love. If my readers get out of my book a tithe of the pleasure and interest which have come to me in the writing of it, I shall be well content. The recording of early adventures has stirred many memories. Describing the life and customs of the natives has recalled to my mind many fine characters amongst them who have passed on, and others who still greet me on every visit, friends of many years, whose goodwill I value greatly.

The tracing of the development of the phosphate enterprise on the islands from insignificant beginnings to the great undertaking of the present day, has been a joy to me. In writing briefly of progress under the Phosphate Commission in recent years, I have realized more fully than ever the good fortune of the Commissioners in having for their management and staff men of exceptional ability, whose ready

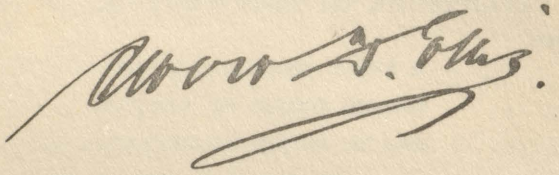
co-operation and resourcefulness, talent for organization and technical skill, have been largely responsible for the remarkable success of the enterprise. I pay to them my tribute of sincere admiration.

To all those who have given me most willing help in the compilation of the book I tender my grateful thanks. Especially would I mention: Mr A. Harold Gaze, C.B.E., General Manager for the Commissioners, who throughout has given me the full benefit of his long and close association with phosphate affairs; Mr J. M. Thompson, A.M.I.E.(Aust.), Assistant General Manager and Chief Engineer, whose assistance in technical matters has been most useful; and my colleagues on the Phosphate Commission, Mr Arthur Gaye, C.B., representing the United Kingdom, and Mr Clive McPherson, C.B.E., representing the Commonwealth of Australia, who have read the book in manuscript and offered many helpful suggestions.

I desire to express my gratitude to the New Zealand Director-General of Agriculture, Dr C. J. Reakes, C.B.E., M.R.C.V.S., D.V.Sc., and the Assistant Director-General, Mr A. H. Cockayne, for reviewing my comments on the relation of phosphate to New Zealand agriculture; also to Mr W. C. Barry, M.R.C.V.S., Director of the Live Stock Division in the New Zealand Department of Agriculture, for supplying veterinary views regarding phosphate; and to Mr H. A. Mullett, B.Ag.Sc., Director of Agriculture for Victoria, who contributed useful information as to the use of phosphate in Australia.

To those whose photographs are used for illustrations I offer my hearty thanks.

When visiting the islands my colleagues and I and our principal executive officers receive much gracious hospitality and courtesy at the Government Residencies, as well as in the phosphate settlements. I take this opportunity of saying how warmly that is appreciated.



Auckland,
May, 1935.

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PART I

EARLY HISTORY AND DESCRIPTION OF THE ISLANDS; THE DISCOVERY OF PHOSPHATE

CHAPTER I

ABOARD THE BRIGANTINE *LADY M*

AWAY back in the year 1890 three of us were travelling in a small sailing vessel from Auckland, our home town, to Howland Island in the Central Pacific, calling at several islands *en route*. My brother George and I were young fellows in the employ of an enterprising London firm, John T. Arundel and Company, working phosphatic-guano islands near the equator, and the third member of the party was Captain Peter Theet, an experienced Pacific islands mariner, who was then entering the employ of the same firm.

We were having a hard trip, even as sailing vessels go. The food was poor to say the least; salt beef in some form or other twenty-one times a week. And such salt beef! One could frequently detect ample evidence that it had been decidedly lively before being pickled. The biscuits had to be dissected at meal-time to release the numerous worms and weevils. What annoyed us a good deal too was the gusto displayed by the master of the vessel, who enjoyed his meals immensely. Everything seemed to be fish that came to his net; dissect the biscuits, not he!

To make matters worse, the sleeping arrangements were unsatisfactory, a certain liveliness of the worst type driving us from our bunks, and on the cabin-floor with the vessel tumbling about, we could not roll far in one direction without coming up against the darkie cook, or in the other without encountering the mate's feet.

As for the navigation, several of the low-lying islands could not be found, though we sailed over their sites, according to the charts. There was always something wrong with the sextant or chronometer, or even with the sun itself. We arrived at one island quite in doubt as to its identity until we went ashore; with such haphazard navigation there were uneasy feelings as to the danger of the vessel bumping against something in the dark.

We passengers frequently used to retire to the after-hold, where, on top of the cargo, we could stretch out and freely express opinions on the state of affairs. At times rank mutiny might almost have reared its ugly head. But we usually found a humorous side to things, and there were also interesting interludes, particularly when Captain Theet used to narrate some of his previous island experiences. Strangely enough it was there in that ship's hold that we first heard of Ocean Island and Nauru, little dreaming that those places would subsequently materially affect our own lives and those of many others.

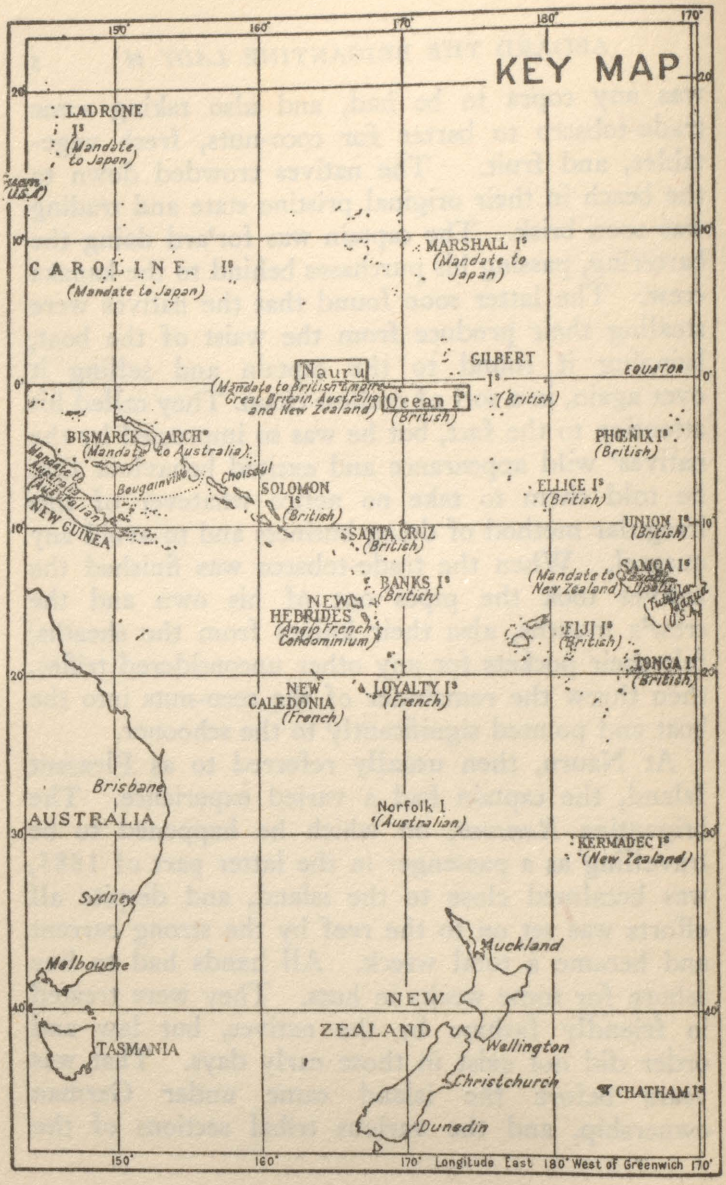
Some years previously the captain, on one of his trading voyages, had hove-to off Ocean Island, and went ashore in the whale-boat, partly to see if there

IN TAPIANG NATIVE VILLAGE, OCEAN ISLAND

TAPIWA CANOE PASSAGE, OCEAN ISLAND
Old-style house built on coral buttress.

was any copra to be had, and also taking some trade-tobacco to barter for coco-nuts, fresh vegetables, and fruit. The natives crowded down to the beach in their original pristine state and trading was soon brisk. The captain was for'ard doing the bartering, passing his purchases behind to the kanaka crew. The latter soon found that the natives were stealing their produce from the waist of the boat, bringing it round to the captain and selling it over again, in a sort of endless chain. They called his attention to the fact, but he was so impressed by the natives' wild appearance and excited behaviour that he told them to take no notice whatever of this irregular method of doing business and to avoid any quarrel. When the trade-tobacco was finished the natives took the pipes out of his own and the crew's mouths, also their knives from the sheaths, felt their pockets for any other unconsidered trifles, then threw the remainder of the coco-nuts into the boat and pointed significantly to the schooner.

At Nauru, then usually referred to as Pleasant Island, the captain had a varied experience. The brigantine *Ransom*, on which he happened to be travelling as a passenger in the latter part of 1885, was becalmed close to the island, and despite all efforts was set on to the reef by the strong current and became a total wreck. All hands had to live ashore for some weeks in huts. They were treated in friendly fashion by the natives, but law and order did not exist in those early days. That was years before the island came under German ownership, and the various tribal sections of the


KEY MAP
150°
160°
170°
180°
170°
20°
10°
0°
EQUATOR
LADRONE Is (Mandate to Japan)
JAPAN (U.S.A.)
CAROLINE Is (Mandate to Japan)
MARSHALL Is (Mandate to Japan)
GILBERT Is
Nauru (Mandate to British Empire Great Britain Australia and New Zealand)
Ocean Is (British)
BISMARCK ARCH° (Mandate to Australia)
Mandate to Australia (Papua)
NEW GUINEA
Bougainville
Choiseul
SOLOMON Is (British)
SANTA CRUZ (British)
BANKS Is (British)
NEW HEBRIDES (Anglo French Condominium)
PHOENIX Is (British)
ELLICE Is (British)
UNION Is (British)
SAMOA Is (Mandate to New Zealand)
Upolu
Tutuila
Manua
(U.S.A.)
FIJI Is (British)
TONGA Is (British)
NEW CALEDONIA (French)
LOYALTY Is (French)
Norfolk I (Australian)
KERMADEC Is (New Zealand)
Brisbane
AUSTRALIA
Sydney
Melbourne
TASMANIA
NEW ZEALAND
Auckland
Wellington
Christchurch
Dunedin
CHATHAM Is
Longitude East
West of Greenwich

native community were at war among themselves, doubtless stirred up by some of the local traders with the object of stimulating the demand for guns and ammunition. Several bullets passed through the huts where the sailors were living, and there were narrow escapes, but nothing serious happened, and in due course another trading vessel took them away.

In this somewhat adventurous manner we were introduced to Ocean Island and Nauru. After a tedious and trying voyage of about two and a half months we arrived at Howland Island. It was only just in time, for we had recruited a number of Niue (Savage Island) labourers early in the voyage, and the ship's water-supply had run short.

We had sighted our destination one evening, but owing to the approach of nightfall had to haul up to the wind, intending to run down on the island next morning. When daylight came, however, we were several miles to leeward of it, owing to the strong equatorial current setting to the westward, and it was twelve days before we finally arrived there. The last tank of water had been drawn on, and short rations issued for some time. The natives behaved very well under the circumstances, but it was an unpleasant experience.

The way in which the sailing vessel was set to leeward showed up the advantages of the prosaic tramp steamer over the more picturesque wind-jammer, not only for navigation in the vicinity of Howland Island, but also of Ocean Island and Nauru, which are in much the same latitude, and in the full force of the equatorial current.

Does the reader ask where Ocean Island and Nauru are? If you were to set out from Auckland, steering about north by west, and pass within sight of Matthew and Hunter islands *en route*, you would reach Ocean Island 2180 miles distant and only 40 miles south of the equator. If you were sailing from Melbourne and left the Australian coast at Cape Byron steering north-north-east, keeping to the westward of the treacherous Chesterfield reefs, and within a few miles to the eastward of Santa Anna, the southernmost island of the Solomon group, you would reach Nauru 2729 miles distant and only 25 miles from the equator. The two islands are 160 miles apart, Ocean being to the eastward of Nauru. Reference to the accompanying map will make their position still clearer; it is interesting also to note the control of the other groups as shown on the map.

CHAPTER II

EARLY HISTORY OF OCEAN ISLAND

Ocean Island, or Paanopa, as it frequently appears in Admiralty charts, was discovered in 1804 and named after the British vessel making the discovery. Beyond those bare facts, we know nothing of the circumstances, but in all likelihood she was a whaler, pursuing her calling. The native inhabitants always speak of the island as Banaba, and they themselves are commonly referred to as Banabans.

Probably there is no island of any importance in the wide Pacific of which so little had been written prior to my first visit there in 1900 for the purpose of prospecting for phosphate. This may be partly owing to its extreme isolation, but also because no commercial value was attached to the place. Its almost uncanny reputation for droughts doubtless kept people away, and apparently it did not have a good name in other ways.

In common with many of the South Seas Islands, Banaba and Nauru in early years were happy hunting-grounds for the beachcombers, those human derelicts who in one way or another had managed to reach even such isolated shores.

Findlay's *South Pacific Directory*, fourth edition, gives the following significant information about the island and its inhabitants, both white and native:

> In November 1845, there were seventeen white men living on shore, several of them runaway convicts from New South Wales or Norfolk Island. Coco-nuts and fowls may be obtained at this island at a moderate price; but strangers should be on their guard against treachery, more especially at islands where reprobate white men are found domesticated with the natives.

This large number of white men is difficult to understand; on the occasion of my visit the natives spoke of only three or four having lived there. Several of their descendants were on the island then, and were easily recognized by their lighter colour and different features.

Arthur Mahaffy, a subsequent Resident Commissioner, in an interesting article on Ocean Island in *Blackwood's Magazine* of November 1910, says about these people:

> Pleasant Island, more fertile and abounding in food however, attracted these men in greater numbers than the barren and forbidding Panapa; but I have heard some stories from one of the oldest and most respected captains of a well-known line of mail steamers who visited Ocean Island in 1852 on a whaling ship, which prove that, in their general character, the white beachcombers of that place were no better than those on Pleasant Island.

From what the Banabans say, the white men were quite of the beachcomber type, though when asked for details as to their doings, they were not very communicative beyond saying that they were different from what we were, which was at least consoling.

One of them, as I found out subsequently, came to a tragic end. He was particularly objectionable after obtaining a supply of liquor from any passing vessel. When drunk he would go round setting fire to the native huts, and on their asking the advice of the other beachcombers as to the prevention of the repeated misdeeds, they were recommended to "tap him on the head," which evidently was effectively done. Particulars of the affair were not readily forthcoming, however, and they seemed to think it should not be talked about. Evidently a severe drought drove the beachcombers away from the island, otherwise they would have been a difficult problem for us in 1900.

The only detailed account we have of Ocean Island in earlier times is contained in a somewhat rare book, *The Last Cruise of the "Wanderer,"* by John Webster, who subsequently settled down at Opononi, Hokianga Harbour, New Zealand. This vessel, a smart topsail schooner yacht of 240 tons, armed with several cannon, was owned by Ben Boyd, a wealthy Englishman with interests in Australia, who had some ambitious scheme about founding a South Pacific Island Confederacy. The *Wanderer* sailed from San Francisco in June 1851, called at the Hawaiian and Gilbert groups, and after leaving the latter, one of the native crew, an Ocean Islander, evidently prevailed on Boyd to call at his island. Webster's account of their reception from the savage but hospitable inhabitants, and his description of the island, is of great interest, con-

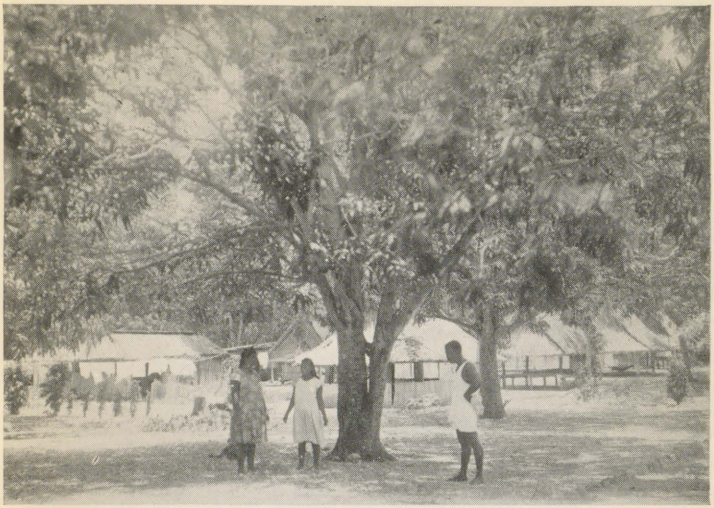
stituting a valuable record of conditions as then existing. It is remarkable that on such a brief visit he was able to learn so much of their manners and customs, but obviously he didn't have phosphate to worry about.

A native population of between 2000 and 3000 is referred to by Webster. This seems excessive, but there are the remains of several other villages on the island besides those now existing, pointing to a large population in earlier years. The question arises as to what reduced the number to 450, as it stood in 1900. Several calls of labour-recruiting vessels accounted for this to some extent, large numbers going to Tahiti and Honolulu. From what the natives say, they left the island by every possible opportunity. It is quite likely that the outbreak of disease among them was also a factor in depopulating the island.

Webster graphically describes the natives, their dress, or rather the lack of it, and their various ornaments. He states:

> They are a fine and prepossessing race, of a light yellow or brown colour, many with the ruddy glow of health on their cheeks. Some of the gentlemen are tattooed from head to foot, with transverse and waving lines. Their most valuable ornaments are necklaces formed of human teeth. Many wear a slender rod, about eighteen inches in length, in their hair, which at one end is decorated with feathers.

They were not wearing the human teeth necklaces when we arrived on the scene, but a number were obtained as curios, which proved very acceptable to



SCENES IN PUAKONIKAI VILLAGE, OCEAN ISLAND

the museum and to several dentist friends, as they constituted evidence of the condition of teeth before the owners had come in contact with civilization. In preparing these necklaces it was quite the right thing for a man to dig up the skull of one of his near relatives and take out the teeth; or if a piece of bone were required for a skewer to make pandanus thatch, to take a shin or rib for the purpose. A day or two after landing on Ocean Island, it gave me quite a start to see a human rib-bone, obviously "fresh," hanging up in one of the huts, and thoughts of secret cannibalism flashed through my mind; but upon inquiry its ultimate use was explained to me.

Webster comments on the tame man-of-war hawks or frigate birds which are such a noticeable feature at both Ocean Island and Nauru. He says:

> I strolled with my gun along the beach, accompanied by a number of young lads. I was well-nigh making an unlucky mistake; observing a number of large birds at a short distance, I raised my gun to fire at them, but was suddenly checked by my companions who motioned me not to fire. They turned out to be tame fish-hawks, belonging to the king; but for what purpose his majesty keeps these birds I am at a loss to determine. They are on the wing during the day, and return each to his accustomed perch at sunset. A native resided in a house close by, whose occupation was, virtually, that of royal falconer, for his sole duty was to look after these birds, and see that they were not molested.

Webster mentions that the son of one of the principal chiefs was named Tapu-ki-Panapa. The present representative of what may be termed the royal family is a genial and friendly man of middle-

age, one of his names being *Tabukin Banaba*, meaning "The crest of the ridge of Banaba." He is frequently referred to as the Crown Prince.

Altogether the account of this early visit links up perfectly with what I saw in 1900, and the description of the caves, the terraces, the pinnacles, and the coral formation is quite correct, but evidently Webster did not arrive at the real nature of the soil, as he says:

> Rocks, water-worn and preserved in fantastic shapes, jut out to a considerable height from the debris of coral forming the soil. As on the other Islands the soil is scanty, and the surface entirely covered with coral pebbles.

The Banaban sailor mentioned earlier was landed from the *Wanderer*, and after taking aboard several young fellows to supplement the native crew, she proceeded on her voyage to the Solomons, where disaster met her. In reading the account of what happened there, it was apparent that undue risks with the savage natives were taken, culminating on the morning of 15 October, when Boyd with his fowling-piece, and taking only a Banaban lad with him, went ashore early. They were never seen again. Two shots were heard, but at the time it was supposed that Boyd was shooting pigeons. The yacht's company was becoming anxious at their non-appearance when it was suddenly noticed that a heavily-manned flotilla of canoes was massing not far distant. Suddenly, with savage yelling of war-cries, the vessel was attacked; the crew was hastily armed with cutlasses and a terrific fight ensued on deck, many

of the Solomon Islanders having swarmed on board. Webster graphically describes how the native crew fought like demons and drove the savages off. They retired in their canoes beyond gun-shot range, but "Long Tom" was brought into action with deadly effect, both on the canoes and on the native village. An armed party went ashore, but nothing was seen of Ben Boyd and his Banaban boy; they were undoubtedly ambushed. The bay where this tragic event happened is still called Wanderer Bay.

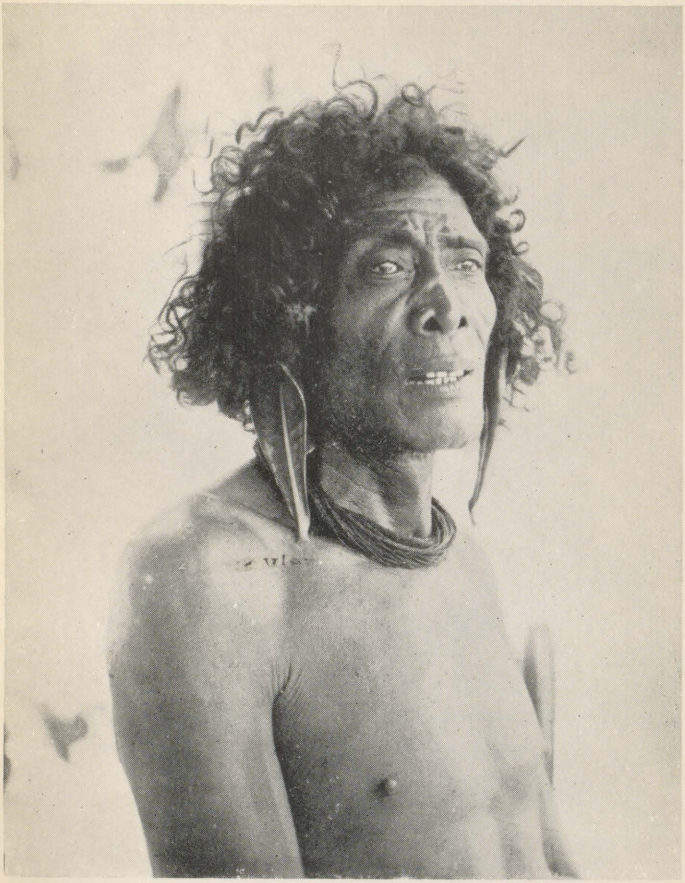
The yacht pursued her voyage, but further disaster attended her and she was wrecked on the New South Wales coast. The "Long Tom" was salvaged and after a varied career has found its way to Albert Park, Auckland, where probably few of the citizens realize its romantic history. Webster mentions that it had done service at Waterloo, and evidently it was presented to Ben Boyd when he was fitting out the *Wanderer*.

In our earlier years at Ocean Island, there was an aged native whom the staff named Old Californian Joe, one of the few travelled Banabans, and several times the old man inquired earnestly of me:

"You know Miti Boy, you know Miti Boy?" He would then go on to talk of the schooner, guns, and kanakas and try to describe what was obviously some tragic event, but in his excitement the pidgin-English manner of speech became quite unintelligible. It was evident, however, that Old Californian Joe was either the native sailor landed from the *Wanderer*, or else was one of the Banaban boys

aboard the yacht during her memorable experience in Wanderer Bay, Guadalcanar, Solomon Islands, and that he was fighting over again that fierce battle on the schooner's deck. When making inquiries of the Banabans as to whether any warships had ever called there, I was told that a vessel "all the same man-o'-war" had been there long ago. This no doubt was the *Wanderer*, there being an interval of fifty years between her call and that of H.M.S. *Pylades* for the purpose of hoisting the flag.

In 1876 the history of the island might have easily taken a very different turn and the phosphate of both Nauru and Ocean Island have been lost to the present holders. An American company had been working the phosphatic-guano deposits on certain islands in the Phoenix Group, also on Baker and Howland islands to the north of the equator. The deposits there were of relatively small extent and of much lower quality than those on Ocean Island, probably about 600,000 tons having been shipped from that source during the American occupation. By 1876 they were practically exhausted and a prospecting expedition was sent out in the schooner *Ariel* to examine other islands in the Gilbert and Marshall groups. Their attention was evidently centred on low-lying islands of similar formation to the Phoenix Group, and though they must have passed fairly close to Ocean and Nauru, apparently these two elevated coral islands were not considered worth prospecting.



A BANABAN OF THE OLD SCHOOL

CHAPTER III

SOME FEATURES OF OCEAN ISLAND

OCEAN ISLAND is a very small place, only six miles in circumference, with its highest point barely reaching 300 feet. In shape it is something like an oyster; indeed rumour has it that several years after phosphate operations had been started, the good people in London City associated with the business used to refer to it as "The Oyster," and their line of thought is fairly obvious. On the south-western side there is a deep indentation—Home Bay—which forms a valuable asset in connection with shipping operations. When seen at a distance of twenty-five miles or so, the island looks like a green mound with a rather flat top rising up out of the sea. As we get nearer, the mound naturally becomes more pronounced, and a slaty grey line is discernible below the green foliage. This is the extremely rugged coast formation, varying in height from a few feet to about 30 feet, and encircling the island with the exception of the southern shore of Home Bay and vicinity of Sydney Point, where there is a fine beach of white coral sand and shingle.

The rocks along the coast-line are entirely coralliferous limestone, very hard, dense and jagged.

No doubt this formation is responsible for the native name of the island—Banaba—meaning the Isle of Coral Rock. The limestone also constitutes the bed-rock of the island, assuming apparently everywhere a strange pinnacle formation. The phosphate deposit overlays these limestone pinnacles to some extent. On the tableland area they are completely covered over, although when quarrying operations are commenced their tops are soon visible. Leaving the tableland, we find the pinnacles more and more exposed according to the slope of the land, indicating that the phosphate deposit is not so deep there. In various parts of the island there are distinct terraces, affording evidence that it has had successive periods of upheaval from the sea-bed, but we cannot tell if these stages of elevation have been of a sudden nature, or if it was a very gradual rise. As we approach the coast on the northern, eastern and south-eastern sides, a dense belt of pinnacles is encountered, 15 or 20 feet in height, averaging 50 yards in width, and almost impassable; certainly entailing a good deal of difficult climbing by reason of the jagged nature of the rocks. The sharp edges are doubtless occasioned by the weathering of the limestone.

Where the pinnacles are overlaid by the phosphate deposit, their nature has become changed, in that they are not so rough, and are covered with a yellowish crust of soft phosphate rock about half an inch in thickness, caused by the soluble phosphate taking up lime, and liberating carbon dioxide in the process. When this crust falls off, usually through

the action of the weather, the pinnacles are left comparatively smooth and quite white, so that a worked-out phosphate field presents a remarkable appearance until gradually the vegetation starts to show up again, and the rocks revert to their usual colour.

Some of the isolated high pinnacles about the slopes of the island are very picturesque, particularly in places where the surrounding vegetation sets them off. Later on, when we were working the phosphate, a Japanese visitor asked me if several clumps of these in the vicinity of the manager's house had been purposely placed there. On being told that they were quite natural, he remarked gravely:

"If you were to ship rocks like those to Japan you would get more money for them than for the phosphate." He considered they would be very ornamental features about the gardens. But the transportation of such heavy material without chipping, and thus defacing it, would hardly be possible.

The question naturally arises as to how the pinnacles have been formed. We can only speculate about this. Possibly they were in being when the island was upraised from the ocean bed. On the other hand, the surf may have worn numerous deep channels in the reef, and when elevated above sea-level, these would appear as irregular ridges, which would gradually assume pinnacle form, under the action of the weather. Near the coast there are usually large quantities of water-worn phosphate pebbles among the pinnacles, and these would have assisted the eroding action of the surf. It is certain that the limestone rock, though hard, is particularly

susceptible to wave action. On the weather side of the island, if one stands out on the reef at low tide, the extent of coast erosion is plainly discernible, and strangely enough the phosphate rock, though softer, has resisted the wave action to a much greater extent than the limestone. It stands up above the reef surface in a series of small pillars two or three feet in height, the limestone in which they were previously encased having quite disappeared.

The reef is of the fringing type. It extends out from the shore practically level for a varying width averaging perhaps 100 yards, and is dry at low tide, while at high spring tides there is about six feet of water over it. The reef-rock is mostly a conglomerate of coral sand and shingle, and though limestone, is of a different nature from the coast formation and the bed-rock of the island, wherein segments of coral are rarely visible.

The difference in formation of these two limestones may be attributable to the land rock having been upraised from the ocean-bed, the reef-rock being of a much later formation. The fact that the latter is the only type found on low-lying coral islands, which are certainly of recent formation, rather favours this view.

The Ocean Island reef is a bad one both as regards building jetties on it, and from the mariner's point of view. Probably the latter would say that all coral reefs are bad, but there are degrees in this, as in most things, and I am afraid the Banaban one would rank rather low in the scale. Arthur Mahaffy states

in the *Blackwood's* article that it is the most dangerous he has ever seen. We have had to deal with worse, but certainly its edge is particularly serrated and broken by deep channels with jagged sides, along which the surge during a heavy surf rushes backwards and forwards, with a force which needs to be experienced to be fully realized. There are no outlying reefs or neighbouring islands to break the oncoming swell, and as the ocean rollers, with the force of the wide Pacific behind them, suddenly encounter the rampart of reef, they deliver their blows with a force that Father Neptune must be proud of. Surf conditions on a sloping beach with perhaps a sandy or pebbly bottom are nothing compared with those pertaining to an isolated coral island. The reefs, nevertheless, are a wonderful protection for the islands. Many of them throughout the Pacific would be, but for this protection, frequently swept by heavy seas. The tempestuous weather causing these heavy seas is not always local, indeed is sometimes a couple of thousand miles away. The heavy swell occasionally experienced in mid-ocean during calm weather is often of equally distant origin.

The Ocean Island reef, however, is not always in angry mood, and sometimes for months on end the meteorological entry for the day will be "smooth reef." At low spring tides, one can stand right out at the edge of it and look down at the rapidly descending slope of the sea-bed; in some places it is like standing on the edge of a cliff. The casual visitor unacquainted with coral reefs will hardly

realize that he is close to a marine fairyland, compared with which the best aquariums of civilization are dull and prosaic.

The best way of viewing this is from a boat, after borrowing from the marine department a water-glass which is somewhat like a small box with a glass bottom. With this resting on the surface, the sea-bed can be plainly seen in 12 fathoms. The wealth of coral, not the white material we see in museums, but the living coral of all shades and colours, and the seaweed, shells, and fish can be seen to best advantage in about six fathoms. Some of the fish are every colour of the rainbow, and as they and particularly the little blue and green coral fish dart in and out of the branches of larger coral, it gives quite the fairyland effect.

In several places about the tableland, there are entrances to the *bangabangas* (caves) which from time immemorial have been so valuable to the Banabans in affording them their source of water-supply, meagre and unreliable though it has been during drought periods. Below its phosphate deposits, Banaba is honeycombed to an extraordinary extent, and the natives have numerous tales about conditions existing deep down in the bowels of the island. One of these is to the effect that during a particularly severe drought a family in desperation for want of water, decided to put to sea in their canoe and take their chance of reaching other shores. The mother went to the cave for a final search, going deeper than ever before, when she suddenly came on a wonderful pool which quite saved the situation. In

view of its association with the contemplated voyage, it was named *Te Nei are Borau* (the pool of sailing).

Personally I have not had any special inclination to investigate the caves after my first experience of one in 1900, when the taboo was removed in my favour and two women agreed to act as guides. The cave was entered by crawling almost at full length through six inches of black phosphatic mud, for about five yards, though it seemed very much longer. We then came to a large cavern where the torches were lit, and we passed along one of the several passages leading down in a slanting direction. Small pools of water were soon in evidence, and at these the women filled their baskets of coco-nut shells. The sides of the cave were more or less begrimed with the smoke of torches used by generations of Banabans, and the general effect was depressing. Very few stalactites were to be seen, the natives having removed them for the purpose of making their useful bonito hooks. We returned by the same muddy passage, and it was a relief to be in the sunshine again, but my previously white suit was nearer black. Instead of an immediate change, I waded into the surf, which quickly removed the thickest of the mud.

A good many years later, our labourers, while quarrying phosphate, uncovered the entrance to a fresh cave never known of before, and possessed of beautiful features somewhat after the formation of Waitomo and Jenolan Caves. The Banabans were quite excited about the discovery, and in earlier times the cave would have been considered a most valu-

able possession by the native whose land the entrance was on, by reason of the water-supply it afforded.

In a recently published novel entitled *Our Daily Bread*, written by Mr T. W. Haynes, of Melbourne, who visited the island some time ago, the caves form the scene of a romantic experience round which the story centres. It is cleverly drawn, as the precise nature and formation of the caves at so great a depth cannot be ascertained, and the author is safe in thus exercising his imagination, so far as any possible contradiction is concerned.

Owing to the cavernous formation of the island, and also the porous nature of the phosphate deposits, water does not lie in pools even after heavy rain. It sinks into the ground immediately. During drought times therefore, the vegetation is speedily affected, though the principal tree, the Tamana, with its knarled and knotted trunk and wide-spreading branches, stands up to the rigorous conditions wonderfully. The bright green foliage of this tree resembling that of the laurel, and the clusters of highly scented flowers somewhat similar in appearance to orange blossoms, form a pleasing feature dotted here and there about the island, and sometimes growing in clumps. The wood is useful for supplying boat crooks and knees, and it works up very well for furniture. The Banabans use it for a variety of purposes, including canoe planking, ribs, paddles, and hut posts.

The wild almond, which grows into a fair sized tree, is very plentiful about the island, and formerly the nut served a useful purpose, its kernel

being very similar to an almond and not unlike in flavouring. The casing is of a tough fibrous nature and not easy to deal with, so the nut is little in demand when there is other food available. The tree is remarkably hardy, and the nuts dropped here and there in the old phosphate workings speedily germinate and grow well under adverse conditions. The wild almond is thus helping to revegetate what is at present an unsightly feature of the island.

The coco-nuts hold first place in the natives' esteem as food trees, though they have never been numerous enough for the production of copra on a commercial scale. It is strange to see the palm growing in the phosphate deposit, notwithstanding the high grade of the material, and it affords evidence of the adaptable nature of this remarkable tree. The flesh of the nut is used by the natives for several kinds of food, the sap or sweet toddy being most valuable, when used fresh. If allowed to stand three days it becomes an intoxicant of a particularly violent nature, and a great deal of the wild work of the Gilbertese, Marshall Islanders, Nauruans and other Central Pacific Islanders in earlier times, is directly attributable to outbreaks of sour toddy drinking. It seems to have had too much kick for even the normal beachcomber. The sweet toddy evaporated down to the consistency of treacle makes a very good substitute for that article so delectable to the natives and kanakas generally.

From the leaves of the tree, baskets, matting, thatch, torches, fans, and numerous other articles,

are made. The shells too have many uses, and the husk, with its material for supplying high class sinnet, is invaluable. Comparatively little use is made of the trunk of the palm. The wood portion of it, which constitutes a casing for the large centre of fibrous pith, is very brittle though hard enough. Many of the trees show by their trunks a record of the successive droughts to which the island has been subject. During such periods the growth of the trunks has been pinched in to about half the ordinary diameter, and when the rains came growth to normal size has recommenced above the pinched-in section. On the whole, the palms stand up to dry conditions very well, but if there is a prolonged drought, the central shoots of many of them fall over, and the trees succumb.

Next to the coco-nut, the pandanus is the most useful tree, and many different varieties have been developed. Comparatively little attention has been paid to them in later years however, owing to the labour involved in working up the fruit as an article of diet, so it is mostly left to rot on the ground. The leaves afford excellent material for making mats, hats, *ridis*, thatch and baskets, and the trunk of the tree is useful for some of the hut framework. From the coco-nut and pandanus practically all the old-time needs of the Banabans were supplied, and an excellent museum exhibit could be prepared showing the numerous uses that the various parts of these trees could be put to on these Central Pacific Islands. It is related that a missionary in the Gilberts was once holding forth to his flock on the

beneficence of the Creator in providing the coco-nut for them with its multitude of uses. One of them, obviously of a type not confined to the brown race, was heard to comment to the effect that it was a pity a few fish had not been placed in some of the nuts.

Philatelists may be interested in the fact that the photograph of a pandanus-tree at Tapiwa settlement, Ocean Island, constituted the main feature in the first issue of Gilbert and Ellice islands stamps; a surcharged issue of Fiji stamps did duty for a short time previously. Apropos of postal matters, a letter was once received addressed to the Gilbert and Sullivan islands, and in view of some of the happenings of bygone years, the address may be more applicable than it appears at first sight.

Other trees which have been introducd at the island are the paw-paw, mango, sour-sop, guava, lime, a kind of coarse banana, and a hardy species of bread-fruit, known as the jackfruit. The paw-paw grows freely and is invaluable to the white residents. On the occasion of my first visit in 1900, there was only one mango-tree on the island, and now there are hundreds in active bearing, forming a welcome addition in the way of fresh fruit.

There are only four or five other kinds of bush trees besides those already mentioned. Either the "buka" or the wild almond is usually chosen for nesting purposes by the seabird most common on the island, the noddy, a species of tern. This bird is about the size of a dove, though considerably longer in the wing. Its plumage is nearly black and an attractive grey crest on the top of the head

sets it off effectively. The noddy is a perky, friendly little chap as he flies backwards and forwards in the vicinity of the nest, meanwhile vigorously giving forth his various notes, the commonest of which is something like the caw of a crow. He is a very clever fisherman and never guilty of doing anything in the way of scavenging, like the gulls of civilization.

The bird with the greatest charm, however, is the little white tern, somewhat smaller than the noddy, with snowy white plumage, and the brightest eyes imaginable. He hovers above one only a few feet away, meanwhile chirping in the friendliest and most interested manner. Only one egg is laid, and a slight hollow in the sloping branch of a tree is selected for it, without any attempt at a nest. There the young bird is hatched out and remains in that spot as if glued to it. There is not a great number of these feathered friends on Ocean Island, but they are treasured by all bird lovers. Like other members of the tern family, they too are great fishers, but are not found so far out at sea as the wide-awakes and noddies; when seeing them before sighting land, we always know it is in the vicinity.

On the reef at low tide, the smoky grey coloured herons are occasionally seen fishing the pools in their usual style, and some varieties of snipe and sandpiper are frequently in evidence. Seabird life on Ocean Island is, however, comparatively scarce, the low-lying islands of the Phoenix Group in the same latitude, but far to the eastward, being much better off in that respect.

CHAPTER IV

NAURU IN THE EARLY DAYS

NAURU was discovered by Captain Fearn of the American whaling ship *Hunter* in 1789, and named by him Pleasant Island, owing, it is said, to the pleasant appearance and manners of its native inhabitants. Up to the time of the German annexation in 1888 the island was still called by that name, but as with others which came under their flag, the native name was then adopted for common usage.

The past history of the island, and the conditions under which the natives lived, can be traced from various accounts of vessels calling there, usually for the purpose of procuring fresh provisions or in connection with their trading operations. The earliest of these which has come under our notice was written by Michelena y Rojas, a Venetian, who was there between 1830 and 1840. His vessel hove-to close to the island, and the natives paddling off in their canoes, flocked aboard, evidently alarming the ship's company by "their hostile behaviour." Fresh provisions, however, were badly needed, and the captain prevailed on Michelena y Rojas to go ashore, taking a supply of "artificial pearls, tobacco, and materials of different colours," partly as presents for the chiefs and also

for bartering purposes. The reception accorded him was obviously disconcerting, as the following extracts from his narrative indicate:

On my arrival at the shore I was really assaulted by more than three hundred natives of both sexes and all ages. I had scarcely put my foot on land when the strongest men amongst them seized my person and disputed its possession, but without maltreating me. From their gestures and manner of behaviour I only understood that each one wished to take me to his own Chief. . . .

He went on to say:

Although I showed a smiling face and gave no sign of fear, I was feeling very uneasy and I thought of the many fearful accidents which had happened to European sailors on the Pacific Isles, especially as the dispute concerning my own person was becoming animated. As a safeguard against an attempt on my life I tried to win over the fair sex, which is everywhere powerful, so I walked along and distributed amongst the girls, the chiffons which I had brought with me. By this means I succeeded, so that at the end of my journey, my bodyguard consisted of girls only, and that gave me sufficient assurance that my hosts would respect me.

Evidently Michelena y Rojas was a firm believer in the old saying that "it's no use growing old if you don't grow artful."

Proceeding with his account he says:

At last I arrived at the Chief's hut. The Chief received me courteously and carried my hand to his mouth. Immediately one of his servants brought a sleeping mat, which he spread on the ground. The Chief invited me to sit down; he did the same himself, and sat down opposite me. The people who had accompanied me from the shore, as well as all the inhabitants of the village, stood around us. Then started a pantomimic audience, as it might be called, as we could not make ourselves understood otherwise than by signs

and gestures. I set aside the role of Ambassador, and I made them understand as best I could, by grunting like a pig, that I wanted to take back to the ship some of these animals —that being the principal aim of my mission. As for the other things I wanted, I easily succeeded in making myself understood, especially as we had some vegetables and fowls before us.

The description of his experiences is quaintly and graphically narrated, and it constitutes a valuable record of those early days. Apparently tribal jealousies existed to a considerable extent even then, and his bartering operations were retarded thereby. However, nothing particularly alarming occurred, and the visit was fairly successful as regards obtaining supplies. His account of the natives' weapons and coco-nut fibre armour is interesting and shows that their practice in such matters was very similar to old-time Gilbert Islands usage. The natives do not appear to have had any fire-arms on the occasion of this visit, nor is there mention of any beachcombers living on the island at that time.

Later information regarding conditions on Nauru is contained in Commander Simpson's report on his visit there in February 1843. He gives an interesting description of the island and its native inhabitants, who apparently had not changed materially since the earlier visit referred to. However, the beachcombers meanwhile had put in an appearance and the following extract from the report is quoted:

The island has been like many other islands in the South Seas, plague infected by Europeans, who are either escaped convicts, the dregs of humanity or runaways from the whale ships; for the most part they are men who defy description,

and in whose eyes it seems to be rather a privilege to lead a dangerous life of idleness and ease amongst uncultured savages than to subjugate themselves to the beneficent restraint of a civilized society. It is a life as one can easily imagine of such people, without law, religion or education to guide them, and with an almost inexhaustible quantity of intoxicating liquor which they prepare by way of distillation from the palm wine which trickles from the coco-nut trees. This alcoholic liquor is not very palatable, but to use their own language "it tickles the brain." In their drunkenness the worst crimes are committed by these wretched fellows. By their bad example and behaviour they do a great harm to this naturally calm and quiet race of men, and check considerably the great work of civilizing and christianizing, if the blessing is brought to them by the men of God. These devils in the shape of men often incite the diverse tribes to commit bloodshed, in order to secure for themselves a share of the booty of the defeated.

The commander then gives particulars of some of the murderous doings which took place among these ruffians, as narrated to him by a runaway sailor from a London whale-ship. Naturally the character of the natives suffered by such bad examples, particularly after learning the use of fire-arms, which they acquired by any opportunity which offered. An apparently authentic report which has come under my notice states that the produce of the island was bartered for fire-arms on the following basis:

1 revolver.	1500 coco-nuts.
1 rifle.	1500-2000 coco-nuts.
50 cartridges.	1000 coco-nuts.
1 small cannon.	100,000 coco-nuts or 50 pigs.
1 medium cannon.	100 pigs.
1 large cannon.	50 barrels of coco-nut oil.

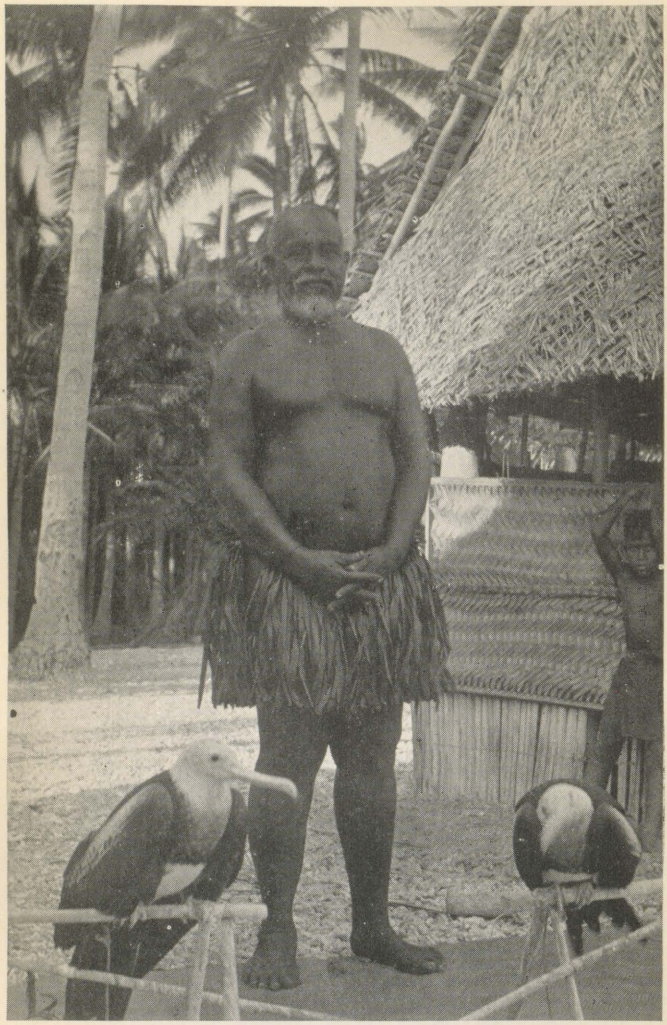


Photo: T. J. McMahon.

OLD-TIME NAURUAN WITH HIS MAN-OF-WAR HAWKS

Quite a large number of these old muzzle-loading cannon are still to be seen on the island, constituting solid mementoes of those troublous times. The report goes on to state:

> Eventually each family possessed its gun and even several; they formed factions which continually made war by using the newly acquired weapons, especially under the instigation and often under the immediate command of the whites. The natives, fascinated by their war successes, ended by becoming real brigands. In the year 1852, they surprised the American brig *Inda* and captured it owing to a dispute over a cannon which had been promised to them. At the instigation of the whites and with their help, they scaled the boat, killed the captain and a number of the sailors and took two prisoners. After looting the vessel they allowed her to drift away.

Such a tragic event naturally led to the island getting a bad name in shipping circles, but taking everything into consideration, it is remarkable that the natives did not become hopelessly demoralized under the conditions which existed on their island for many years.

The next record is from a book *The Great Days of Sail* by (Captain) Andrew Shewan, who was first mate on the China tea clipper *Norman Court* when she hove-to off the island on 22 March, 1871, apparently not for any specific purpose. The natives promptly boarded the vessel in considerable numbers, also a European who is described as a "villainous looking red-bearded white man" and was dubbed "The Pirate." The alert officer did not like the position altogether, and took no risks. An armed guard was set, and cutlasses were served out unosten-

tatiously. He remarks that while not particularly objecting to the fifty or more "Adams" coming aboard, he drew the line at a boatload of "Eves" who came alongside. Later on a man of the name of Harris, about sixty years of age, went aboard and evidently reassured the ship's company. He was referred to as the king of Pleasant Island, and stated that the Nauruans were at war among themselves, but not interfering with the whites on the island, of whom there were six others.

The natives were bartering their articles of trade with the sailors for tobacco, old iron, and bottles, when a dispute occurred and knives were drawn on both sides. Nothing very serious happened, but the officer thought it was time to get under way again. So the yards were trimmed to the wind, the big vessel gathered speed, and one can imagine the natives swarming down to their canoes, or probably jumping overboard as being the easiest procedure. "The Pirate's" boat did not fare well, and was swamped alongside, which angered that gentleman very much, as it contained the articles he had traded for—biscuits, flour, and a flask of powder. His forcible language on the occasion impressed the officer, and Harris was uneasy, seeing that his son was in charge of "The Pirate's" boat.

Captain Shewan concludes his very interesting account by commenting on the fact that in 1871 none of them had any idea that Pleasant Island contained valuable phosphate deposits.

The next call at the island holds pride of place, for the First Gentleman in the Empire was on board

—His Late Majesty King George V. On 21 September 1881, H.M.S. *Bacchante* with Prince Albert Victor and Prince George aboard, arrived off the island, with the other vessels of the squadron. The two Princes were then midshipmen in the Royal Navy, and were going round the world.

The visit is described in the following extract from *The Cruise of the "Bacchante"*:

At 8.30 a.m. sighted Pleasant Island, about twenty miles off north quarter west. It is a very small island about four miles in diameter, lying in Lat. 0° 35′ S. and Long. 166° 49′ E.; it is said to have been so named on account of its being situated in a most unpleasant temperature. This or another similar island, near the line,

> Rich, but the loneliest in a lonely sea,

would be that on which Enoch Arden is supposed to be cast away on his return voyage from China at the end of the last century, and where he

> Set in this Eden of all plenteousness,
> Dwelt with eternal summer, ill content;
> The blaze upon the waters to the east,
> The blaze upon his island overhead,
> The blaze upon the waters to the west.

The flagship stood in towards the island, and two canoes and a whaler apparently put off to her. We could see on the west side of the island a number of huts and groves of coco-nut trees. The flagship semaphored when she rejoined the squadron in the evening: "A civil war on the island. An escaped convict is king. All hands constantly drunk: no fruit or vegetables to be obtained, nothing but pigs and coco-nuts. The present island-king wants a missionary. He was evidently hungry." After passing the island we fell in with several rain-squalls, during one or two of which we ran along over eight knots, after that there fell a calm. Resumed our station in line, but as the airs were light and variable it was a difficult matter to keep it. Between 10 and 11 p.m.

we crossed "the line." The sun himself crossed "the line" at 1 a.m. on the 22nd, so we have had two hours of summer this year, although the weather is quite warm enough (88°).

The idea of Nauru, or alternatively Ocean Island, being the supposed scene of Enoch Arden's tragic experience when shipwrecked is very interesting, and at least several good reasons could be advanced in support of that view, particularly if we make due allowance for poetic licence. It is singular that the line "Rich, but the loneliest in a lonely sea" is quoted, in view of the fact that subsequent developments have resulted in its being referred to as "the world's wealthiest isle." "Loneliest in a lonely sea" is also particularly fitting, and "The blaze upon his island overhead" is quite appropriate. No one would dispute that fact when taking a midday walk on Nauru or Ocean Island.

The call of the squadron must have impressed the natives tremendously. Apparently "King Harris" went aboard the flagship, the other beachcombers perhaps considering it was advisable to keep out of sight.

A good deal of information about the state of affairs on Nauru a few years later is contained in the book, *Through Atolls and Islands in the Great South Sea*, by F. J. Moss, M.H.R., of Auckland, and we are indebted to this publication for the following particulars. He was a passenger on the Auckland schooner *Buster*, under the command of our friend and subsequent fellow employee, Captain Peter Theet, of whom Moss speaks highly. The vessel

BUADA LAGOON, NAURU

called at Nauru in 1887, and while copra-loading operations were proceeding, Moss went ashore and had definite evidence that fighting was still going on among the native tribes. Regarding them he says:

> They were in high good humour, but all the men and most of the boys were armed with repeating-rifles and carbines. The dress of both sexes consisted only of a short kilt of pandanus leaves hanging to a string round the waist, and each of the armed crowd had slung over his shoulder a pouch well supplied with ammunition. Despite their formidable get-up, the people had a kindly look with fine open eyes and magnificent teeth. Polynesians, one would say at a glance, but well dashed with Indian blood if the slight, active, and graceful forms of the women might be accepted as an indication.

He spent some time with Harris, of whom we quote the following:

> One of the traders, Mr Harris, had been on the Island forty-five years, and was the oldest resident. He is seventy-four years of age, hale and hearty, and looking, with his fresh coloured face and heavy grey moustache, more like an old militaire than a Pacific Island trader.

The internecine strife which had evidently been going on for about fifteen years was attributed by Harris to the "hellish sour toddy," the making of which was introduced by some Gilbertese. These men had first reached Ocean Island in their canoes, and had taught the natives there how to make the intoxicant. The Banaban chiefs, however, on seeing its deadly nature, gave them the choice of putting to sea again, or taking the consequences. I was told of this incident when at Ocean Island, with the addition that the Gilbertese had plotted to obtain

possession of various lands. Further particulars supplied by Harris were to the effect that on seeing that their lives were in danger, they decided to put to sea, and in due course arrived at Nauru. The feud started on a point of etiquette at a native wedding. They had been drinking "sour toddy"; a dispute arose and a horse-pistol which happened to be handy was fired. The wrong man was shot, a young chief of high family; his death had to be avenged, and the trouble gradually spread until practically all were involved.

It appears that the fighting took the form of more or less indiscriminate sniping among the various tribes, of whom there were about twelve on the island, one for every mile of circumference.

To quote Moss again:

> As to the natives, it seemed to me they have had enough of it and would be very glad to be disarmed if it were done simultaneously. The position in this respect is easily understood, especially when we consider how many great nations in Europe are at the present time in much the same quandary, and would be glad to disarm "if only" as the Pleasant Islanders say, "the other fellow will begin." It is "that other fellow" who is doing all the mischief at Pleasant Island as elsewhere. He always does.

Though written nearly fifty years ago, these remarks have a singularly up-to-date ring.

Whatever Harris's antecedents may have been, he had risen above his surroundings in his later years, and obviously impressed Moss very favourably. It was a tragic time just then so far as the old trader was concerned, for one of his half-caste sons was lying dead in an adjacent hut, having been shot, and

he was the second one to meet that fate. Harris was very desirous that a mission should be established on the island, or else that he and his family should get a passage to Kusaie in the Caroline Group, the local headquarters of the American Mission, which was the only Society in those seas at that time.

Later when the *Buster* arrived at Ponape in the Carolines, Moss wrote to the mission authorities at Kusaie, evidently putting in a strong plea. He refers further to the matter as follows:

> I cannot tell what the mission authorities at Kusaie will see fit to do, but may express a hope that the old man will be successful in saving his young family from growing up amid such wretched ignorance and barbarism. It would be also pleasant to find his offer lead to the establishment of a mission and the restoration to peace and prosperity of this singular little island and its naturally pleasant people.

Apparently about the time of the German annexation of Nauru in 1888, the mission schooner *Morning Star* called there, landing a Gilbertese native pastor, Tabuia of Tarawa, who had charge of the mission up to 1899, when German-American missionaries, Rev. and Mrs Delaporte, arrived and were stationed on the island for a number of years. It is said that when the German warship called, the chiefs were held as hostages until all the fire-arms were given up. A state of law and order was established, and those conditions existed when I arrived there in May 1900 with the object of prospecting for phosphate deposits.

CHAPTER V

SOME FEATURES OF NAURU

NAURU, like Ocean Island, is an elevated coral island, though its characteristics differ in many ways. For instance there is a flat coastal belt of identical formation to that of the ordinary low-lying coral island. This belt is 400 yards wide in places, particularly on the western and south-western sides, but probably 150 yards is about the average width. It is covered with a dense growth of coco-nut trees, constituting a very valuable area for the native inhabitants. The soil there is coral sand, the phosphate deposit being confined to the elevated portion of the island. With the exception of Buada, a village on the shore of the lagoon inland, all the natives live on the coastal belt, so things are very well arranged on Nauru in that the coco-nuts grow where there is no phosphate, and where the phosphate deposits exist there are practically no coco-nuts.

At the inner edge of the coastal belt the land either slopes upward for 100 feet or so, or else there is a line of high limestone rocks, almost cliffs in places, behind which the land rises gradually. The interior is mostly undulating, with hills here and there, the highest of these being about 200 feet.

The island is about 3½ miles long, 2½ miles wide, and 12 miles in circumference, with a good road running right round. It is roughly oblong in shape, with a wide indentation on the south-eastern side, named Anebare Bay. The beach is coral sand and shingle, almost identical with the type of beach on the ordinary low-lying coral island, excepting perhaps in one locality where there has probably been coast erosion, and there the phosphate rock runs down almost to the sea.

There is a brackish lagoon several acres in extent about a mile in from the western coast. It is approximately at sea-level, but has no direct outlet to the sea. From time immemorial a special kind of fish has been cultivated by the Nauruans in this lagoon, which is divided for the purpose into a series of sections by barriers of coco-nut leaves, piled on top of each other. Each section is owned by a separate family or group of families, and is valued much more than a corresponding area of coco-nut land. The spawn of the fish is collected by the Nauruans on the ocean reef, and carried across to the lagoon in coco-nut shells. It grows into handsome silvery fish, resembling mackerel, and they are netted when about 18 inches in length. They are good eating, but to the white man's taste are excessively bony; the common herring is free from bones compared with them.

These remarkable fish are not peculiar to Nauru. They are cultivated on several of the Gilbert Islands also, and are called *beniawa* there. On Hull Island, in the Phoenix Group, where I was stationed in early

life planting coco-nuts, there were about half a dozen ponds near the shore of the large sea-water lagoon which were alive with these fish, and any required could be knocked over with cane knives in a few minutes. The island was uninhabited when we went there, so it would appear that the spawn was carried to the ponds by an overflow of the lagoon during heavy weather. The food of these fish is somewhat mysterious, but they thrive on it, and are so fat that they can be cooked in a dry frying-pan. We found, however, by painful experience, that the bones were so troublesome that it was inadvisable to eat the fish, in view of our remoteness from a throat specialist.

There are some areas of dense pinnacles on Nauru, particularly at the south-eastern side bordering on Anebare Bay, and on some of the steeper hills they are very much in evidence. Elsewhere they are dotted about, the frequency with which they occur largely indicating the depth of the phosphate deposit. As at Ocean Island, it is obvious that the pinnacle formation extends over the whole of the elevated portion of the island. In various places large isolated pinnacles are to be seen resembling to some extent the ruins of a small castle. Sometimes passages lead into the interior of these, and about the centre there is a small circular shaft running right up to the surface. Possibly this shaft affords a clue to their origin, indicating a type of blowhole in the island's early history. At Menen village to the south-west, there is a clump of high

pinnacles right out on the ocean reef, probably the result of coast erosion in that locality.

A remarkable formation exists near the centre of the island usually referred to as "the crater." It is about 15 feet in diameter, quite circular in shape, and goes down perpendicularly about 60 feet. Using ropes, some of us went down this shaft in 1901 with Nauruan guides who took us along subterranean passages at the bottom, branching out and descending at a gradual slope. There was no sign of volcanic action, and the conclusion I arrived at was that in the early stages of the island's existence, when perhaps only a few feet above sea-level, this was a gigantic blowhole, the surge rushing along these passages, converging at the bottom of the shaft and then spouting up with great force.

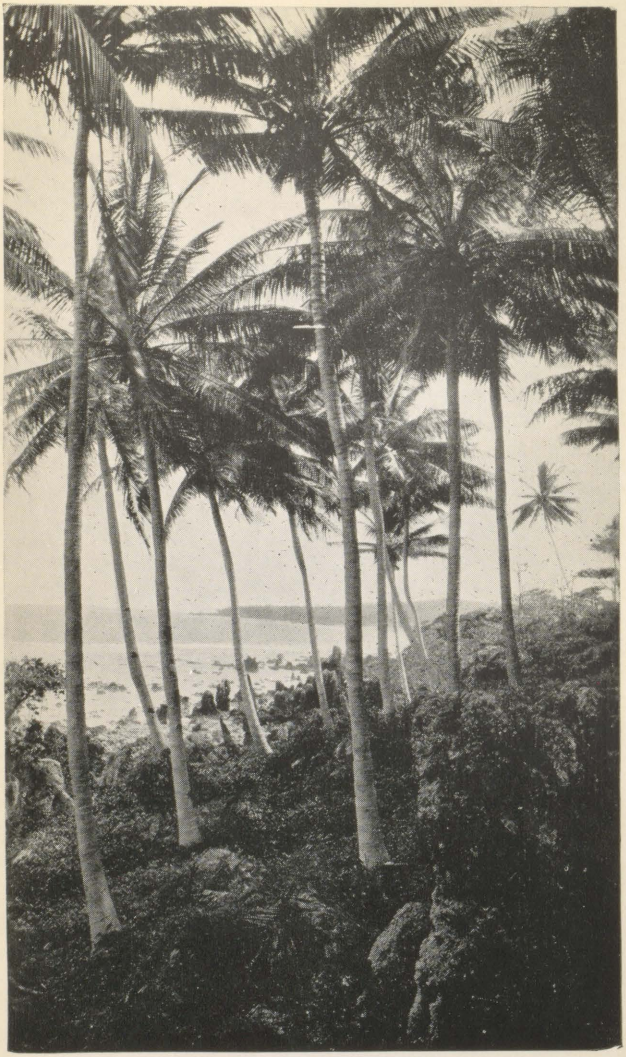
There are various caves on Nauru, though evidently not on the same great scale as at Ocean Island, nor have they served the same useful function as regards the water-supply. In earlier years they were used by the natives for burial purposes, and in one that I visited in 1901 there were numerous human bones scattered about the floor. The Nauruans have never needed to look on the caves as a source of water-supply, as they have wells in places along the coastal belt near the base of the higher ground, and though the water contains a good deal of lime, it meets their requirements.

The reef is of the fringing type as on Ocean Island, but averages somewhat wider. On the western side it is of a smoother surface, and not nearly so serrated at the edge. The sea-bed slopes down at

the same steep angle, about 45 degrees, causing similar difficulties in the matter of laying deep-sea moorings for vessels. Nauru by reason of its trend and larger size has a longer lee than Ocean Island, affording more shelter for the shipping, and this is one of its many advantages so far as our industry is concerned.

As regards weather, a subject which is of vital importance to the success of our operations, Ocean Island has some advantage in being 170 miles to the eastward. The prevailing wind for nine or ten months of the year is the easterly trade wind, not blowing so strongly as farther south, but with the fine weather conditions so necessary for our work. In November and on to February westerly gales are sometimes encountered, blowing hard at times for a week or ten days, with squalls of great force and very heavy rains. It appears that the latitude of the two islands at that time of the year in particular is a sort of battling-ground between the fine weather easterlies and the bad weather westerlies. Sometimes a moderate gale will work up from the westward, pressing the easterlies back until it reaches Nauru, but not extending so far as Ocean Island; usually after blowing a few days from the west it moderates, and the easterlies again get the ascendancy.

"Doldrum" conditions are sometimes experienced during the bad weather months, when squalls suddenly come up from any direction, frequently veering round and blowing on shore, thus necessitating the utmost vigilance during shipping operations.



ANEBARE BAY, NAURU

When there is much westerly weather about, the equatorial current, which normally sets strongly to the westward, either ceases or is replaced by an equally strong current setting to the eastward. This is a distinctly bad weather sign, particularly when driftwood, such as trees with their roots and branches, are brought along. These signify that violent and sometimes prolonged gales are in progress to the westward, and will probably work up.

There is, however, no fixed rule or cycle for the weather; sometimes the easterlies continue throughout the year, and bad westerly weather may not be experienced for several years in succession. These conditions are the cause of the occasional severe droughts, and though favourable for phosphate operations, they seriously affect the supply of water for the island communities, besides conducing to outbreaks of dysentery at times. Then again, occasionally an abnormal year is experienced when westerlies come along at intervals even during the fine weather months. Several of these years in the past have been almost a nightmare by reason of the difficulties with the moorings and the shipping. An apology seems necessary for saying so much about the weather, but if the reader would understand the facts of the phosphate industry on Nauru and Ocean Island, he must know something about the weather experienced there, for so much depends upon it.

The vegetation on Nauru is very similar to that on Ocean Island. There are a few more varieties of bush trees, but they are more a matter for botanical interest than of practical utility. The great

growth of coco-nuts has always been a valuable asset for the Nauruans. In earlier times when copra was their sole item of revenue, up to 300 tons have been shipped in a season, but the production has always fluctuated in line with the annual rainfall. The coastal coco-nut lands fortunately are not affected by droughts to the same extent that Ocean Island is, and so the trees seldom die from that cause. The giant hibiscus is fairly plentiful on both islands, with its large yellow flowers, purple-centred, which are in much demand by the Nauruan maidens for making very effective chaplets. Perhaps their most original head ornament is a sort of living halo formed by tethering about a dozen of the large "toddy" moths, with threads fastened to their hair. The moths are about the size of a humming-bird and the effect produced by girls walking along with them flying about their heads is quite unique. They go well with the frequently picturesque *ridi*, and their brown skins, which really seem like an extra garment. The wood of the giant hibiscus is remarkably light, and owing to that feature it was much used in earlier years, particularly at Ocean Island, for making small fishing rafts.

The position of Nauru and Ocean Island affords food for interesting reflection as to the arrangement of the Pacific Islands generally. If a map is examined, it will be seen that the various islands resolve themselves into two distinct series, located in two broad belts running parallel to each other, and trending about W.N.W. and E.S.E. In the southern belt are the large high volcanic islands, the main

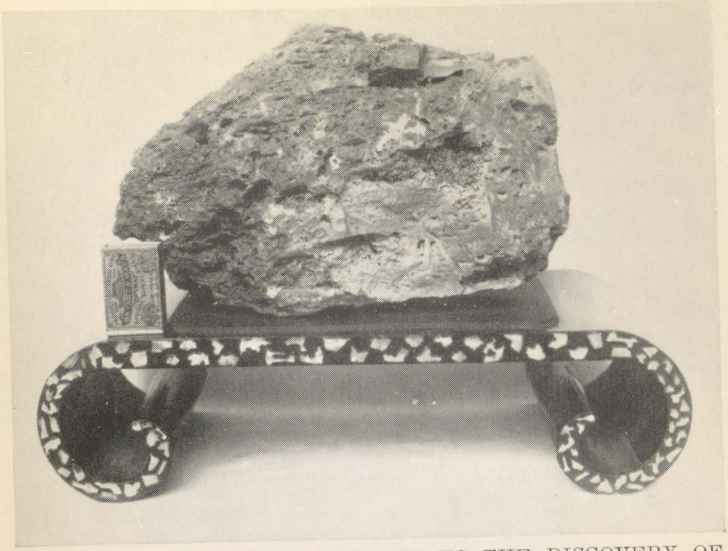
groups being the Austral, Society, and Cook islands, Samoa, Tonga, Fiji, New Hebrides, New Caledonia, Solomon Islands, New Britain, New Ireland, and the Carolines.

The northern belt is comprised entirely of low-lying coral islands, more than three-fourths of them being atolls. Starting from the Paumotu Archipelago, it runs between the Society and Marquesan groups in a narrow strip, then widens out to embrace Manihiki with the adjacent low islands and the Tokelau, Phoenix, Ellice, Gilbert, and Marshall groups. With the exception of Pitcairn and several other small, though fairly high islands at the extreme southern end of this belt, there is not a single island in the whole 4000 miles of length that is more than 30 feet above high-water mark. Most of them are considerably lower.

Perhaps before going further we should explain the term *atoll* in case any of our readers are unacquainted with this primitive type of coral island. It is either a circular, oval, or irregular shaped strip of land enclosing a lagoon which may or may not have deep-water passages connecting it with the ocean. The land varies in width from 200 to 300 yards, up to, say, half a mile. From the seaward side a fringing reef runs out in the same way as the reefs at Ocean Island and Nauru. Sometimes the atoll consists of a chain of narrow islets dotted round on a reef which is dry at low tide; in such case these would gradually increase in size as coral sand and shingle are accumulated on their shores, and thus tend to unite, forming a longer stretch of land.

If we admit the theory that atolls are built by the coral polyp on the rims of sunken craters, or alternatively that they rise up from the sides of gradually subsiding mountains, it is evident that there were many enormous mountains at one time in this northern belt. Some of the Gilbert Island atolls are 40 or 50 miles in length, and lines of deep-sea soundings taken across the two zones prove that the depths are much greater in the atoll belt than in the southern zone. The maximum shown on Admiralty charts is in the vicinity of the Phoenix Group, where a sounding of 4000 fathoms (24,000 feet) is given.

It points to subsidence on a colossal scale in the 4000 miles of atoll area, and the theory I have formed is that this was once the site of the great Central Pacific Continent which Magellan, Mendana, De Quiros, and other Portuguese and Spanish navigators were convinced *did* exist, and for which they searched so assiduously in the sixteenth and seventeenth centuries. It is a strange fact that at each extremity of the atoll belt we have proofs of previous large land masses. On Easter Island there are the rows of enormous prehistoric stone images, obviously formed when there was a very large population in the vicinity. At the other extremity is Ponape in the Carolines, with its remains of a very extensive prehistoric stone city, which must have been built when there was a large population in that locality. Neither Easter Island nor Ponape could have supported the large communities which must have existed when these enormous works were carried out. There are also prehistoric stone structures on



THE PIECE OF ROCK WHICH LED TO THE DISCOVERY OF PHOSPHATE ON NAURU AND OCEAN ISLAND

Photo: A. F. Ellis

PROSPECTORS' CAMP AT OCEAN ISLAND, 1900

the Marquesas and Tahiti, both bordering on the atoll belt. Were all of these the work of the inhabitants of the lost continent, possibly contemporaries of Britain's ancient stonebuilders who carried on their priestly rites at Stonehenge and are similarly lost in oblivion?

It may be asked, where do Nauru and Ocean Island come in? They are situated on the line of demarcation between the two belts, and they differ in formation from the islands in either series, although there are certain elevated coral islands like them scattered through the southern or volcanic belt. A good many of these are quite familiar to me as I have visited them in connection with prospecting for phosphate. Is it not possible that the same convulsion of the earth's crust that accounted for the subsidence of the lost Pacific Continent also caused the raising of Nauru and Ocean Island from the sea-bed?

This suggestion and the supposed locality of the lost continent are theories. Perhaps others have thought on parallel lines previously, but if so I have never seen any statement to that effect. Theories are made to be torn to shreds, and if the foregoing shares that fate, I shall feel complimented by the attention bestowed on the matter, combined with the reflection that a similar fate will no doubt await any opposing theories.

CHAPTER VI

A GOOD "FIND"

With the stage set for telling our story, we return to the period following on the eventful voyage in the brigantine *Lady M.*

The years had slipped by and it was not until the closing months of 1899 that Nauru and Ocean Island again came under special notice. Meanwhile the Company had worked out the meagre and comparatively low-grade deposits on Baker and Howland islands to the northward of the Phoenix Group, and with all our working plant loaded aboard the schooner *Maile* (Captain Lane) we shifted operations to the Queensland coast.

Raine Island in Torres Strait, Rocky Island in the Gulf of Carpentaria, Lady Elliott Island off Bundaberg and several islands in the Bunker and Capricorn groups, were next worked, under more or less difficult conditions. If we were not making money, we were certainly gaining valuable experience in a very unusual industry.

Operations in those days were on a small scale. Ten thousand tons per annum constituted the objective, and even that was never actually reached. However, let us not despise the day of small things. In this case, as in so many others, they constituted the

chain of events leading on to success. Meanwhile I had worked up to the position of island manager, still retaining the position of analyst, which carried with it the congenial duties of prospecting for further deposits on other islands, sometimes far distant and under fairly wild conditions, quite off the beaten track.

Prospecting for phosphate gets into the blood, and can be quite as fascinating as prospecting for gold, with perhaps even more of the element of romance, for does it not bring one into close touch with lonely islands, frequently uninhabited, with their possibility of all sorts of discoveries and mysteries? Many of us of British stock seem to inherit from our forbears a weakness for island life and adventure, and it is not unlikely that the trait has proved a useful factor in Empire development.

A further milestone in the progress of the business was reached when another island company with trading stations, coco-nut and pearl-shell properties, was merged with John T. Arundel and Company. The Pacific Islands Company Limited thus came into being, with its headquarters in London. Lord Stanmore was the Chairman, and the Deputy Chairman was Mr John T. Arundel, our experienced and honoured chief. Notwithstanding this expansion of operations, business did not improve in the manner anticipated; the position became difficult and the financial barometer increasingly depressed. Market conditions for the Company's various products were bad and the phosphate deposits worked on successive islands were of such small extent and so poor in

quality as to be unpayable; but the truth of the proverb: "It is a long lane that has no turning" then came into evidence. When we seemed to have reached the end of workable deposits in the Pacific, and hardly knew which way to turn, an unexpected development occurred. My father, Mr G. C. Ellis, who was a director in the Company and who had been looking after the phosphate section of the business in Australia and New Zealand, had gone to England, and I was transferred temporarily to Sydney office to take his place, part of the duties being to analyse any samples coming in from the islands. The laboratory was upstairs and on beginning work there I noticed a large piece of rock keeping the door open. It appeared rather like some of the remarkably hard phosphate found in a deep depression on Baker Island, the working of which necessitated the use of explosives. Ordinary phosphate rock as known in the Pacific at that time was similar to soft sandstone and could be readily excavated with a pick.

On remarking to the manager, Mr Denson, that this piece of rock resembled some of the Baker Island phosphate, I was told that it was a specimen found by himself on Pleasant Island (Nauru) about three years previously, and had been classified by some geologists as fossilized wood, which he considered it to be. This seemed conclusive enough, but somehow when at work in the laboratory that piece of rock would catch my eye and its resemblance to Baker Island rock would recur. It was probably three months later that the thought came to test it.

A bit was knocked off, ground up, and the usual preliminary tests for phosphoric acid were made; to my great satisfaction they resulted in a strong reaction.

This was promptly reported to the manager, who was much excited at the news, saying there were great quantities of similar rock on the island. I then made a complete analysis, which confirmed the view that it was phosphate rock of the highest quality, and from the structure of the material one could tell that it was from an old and probably extensive deposit. Moreover, as Ocean Island was known to be of like formation to Nauru, it was considered that a similar deposit would be found there. On the next out-going trading voyage therefore, the supercargo was instructed to call at Ocean Island and bring back specimens of the surface rock. These were examined on the vessel's return to Sydney and some of them proved to be phosphate somewhat similar to the Nauru specimen.

The London Board having been promptly advised of the preliminary discovery, commenced negotiations with the Colonial Office regarding Ocean Island, and with a large German chartered company which held mineral and other rights over the Caroline and Marshall islands, including Nauru. This island became German territory through the Convention of 6 April, 1886, between Great Britain and Germany, defining the limits of their respective spheres of influence. As the result of these negotiations on the part of the London Board, a representative of the Pacific Islands Company was authorized to visit

Ocean Island, and if phosphate was found, to treat with the natives, also to display the British flag there, as the island had not been formally annexed when the neighbouring Gilbert and Ellice groups came under British rule.

As regards Nauru, an agreement was entered into with the German company by which the British company worked any phosphate deposits found on any of their islands, on a royalty basis. Other transactions took place subsequently, resulting in the Germans buying out the trading stations and coconut properties which the British concern owned on their islands, and a certain share interest in the Company was conceded to them. Altogether the matter was handled very ably by the London Board, the arrangements were fair to the other parties concerned, but also in the best interests of the Company, and British trade generally. The way was thus made clear for actual investigations on both islands, and this work was entrusted to me.

CHAPTER VII

"STRIKING OIL"

EARLY in 1900 I left Sydney in the Company's s.s. *Archer* (Captain Henry) bound for Ocean Island and Nauru, calling at Suva and numerous trading stations in the Ellice and Gilbert groups *en route*. The programme was that Ocean Island should first be prospected and if the deposits proved valuable, arrangements were to be made with the natives for the Company to work them. To facilitate the prompt starting of operations, a great deal of preliminary work had to be done. A young New Zealander, Mr L. G. Naylor, was taken as my assistant and a three weeks' stay on the island was arranged for. Almost the parting advice of the manager was:

"Those Ocean Islanders are hard cases. You take your rifle and revolver with you, and as soon as you get on the beach show the natives you can use them." Having in mind Captain Theet's previous experience, we deemed the advice quite appropriate, and the first part was acted on, but not the latter, as it turned out.

As to Nauru, the instructions were to spend the day ashore while copra was being shipped to the *Archer*, to do as much as possible in the way of prospecting, but not to disclose the existence of

phosphate; in short, to see everything and say nothing, something after the style of "Brer Rabbit"!

Early on the morning of 3 May 1900, the *Archer* arrived off Ocean Island, the first impression being a line of surf breaking on the reef, behind which was a 30-foot rampart of rough coral limestone cliffs crowned with groves of coco-nuts and other dense bright foliage on sloping ground rising to a moderate height. The whole constituted a picturesque scene, soon enlivened by numerous shapely canoes dashing through the surf, and in a short time the *Archer's* decks were fairly crowded with strapping, excited natives, nearly all clad in what R. L. Stevenson described as "the perilous hairbreadth *ridi*"—in other words a short skirt made of young coco-nut leaves tanned brown. They brought aboard numbers of shark fins and shark teeth swords, some fruit and vegetables for bartering purposes, and soon the supercargo was busy buying in.

The principal native visitor was Temati, called "The King" by the steamer people, but it appeared afterwards that he was more a "Minister for Foreign Affairs." It was his province to establish communication with the few vessels that called at the island, and come to an understanding with the captains regarding the object of their visit. Owing to his position therefore, he took a prominent part in the proceedings which followed.

The *Archer* stood round the coast of Tapiwa, which was Temati's village, under easy steam on account of the flotilla of canoes being towed astern and abeam. Trading operations meanwhile continued

briskly on board, for the natives knew by experience that steamers did not wait long at the island. As we passed Lilian Point, Home Bay opened up, with Sydney Point away to the right, and a scene of impressive pristine beauty rapidly spread out before us, everything looking at its best on such a bright sunny morning. The object of our visit, however, was of too pressing a nature to permit of much attention being paid to the scenery. The bay has a fine coral sand beach at its southern end, the best landing place being off Ooma village, and there we went ashore under smooth surf conditions. The Ocean Island reef was on its good behaviour, particularly in the bay.

The prospecting trip which followed was probably a record one for shortness and decisiveness; also in regard to the quality of the phosphate discovered. We passed up through the native village, and a hole was sunk in the rising ground just beyond. The result was a gratifying surprise, for not only was rock phosphate thrown up, but all the fine alluvial intermixed with it appeared to be phosphate also. Several tests by means of the portable laboratory proved this to be the case, and the quality of both rock and alluvial to be very high grade. Proceeding inland about a mile, we sank several more holes at intervals, and in each instance nothing but phosphate was turned up. A further gratifying feature was that in no case did we reach the bottom of the deposit. The general formation of the surrounding country was noted, and the decision was arrived at forthwith that the island contained extensive deposits

of outstanding importance. At last we had "struck oil" and there never was a "gusher" more welcome or more opportune.

Preliminary arrangements for the working of the phosphate were made with the natives, one of their number, Tekana, who had travelled and who was one of their leading men, acting as interpreter. There was no difficulty in the matter, as they were eager to come into closer touch with civilization. The proposal that I should stay on the island for a time, accompanied by Mr Naylor, was welcomed, but on one point Temati was adamant; we were to live at his village, not at Ooma. It was soon evident that there was intense rivalry between the two main villages; relatively speaking, the feeling between Melbourne and Sydney, or Auckland and Wellington, was a mere bagatelle in comparison.

The *Archer* accordingly steamed round to Tapiwa again and there we were landed with a boatload of camping material, provisions, water, trade goods, and tools for prospecting, surveying, taking soundings, and other necessary work. One of the native sailors, Temori, remained ashore with us as interpreter and to help generally; also a faithful Niue boy, Toopi, as cook. The *Archer* then took her departure for the Northern Gilberts to continue her trading voyage, and as she disappeared in the distance leaving us on the beach, we felt that we had entered on the great adventure.

No sooner was the vessel gone than the natives' wild excitement vanished, and we soon realized that they meant to be friendly and hospitable. What

about their thievish propensities of which so much had been heard? During our three weeks' stay we did not lose a thing, though there were ample opportunities for pilfering, as the trade goods and provisions were kept in an open-sided hut. The explanation was that some years previously a native teacher had been left on the island by the American mission vessel *Morning Star*, and he had done good work. About half of the native population of 450 were *Kain Kiritian* (Christian people) and the example of the native teacher had also favourably influenced the remaining *Kain Began* (Pagan people).

We pitched the tent for the first night on the outskirts of Tapiwa, as the village itself was much too smelly, but even then it was not pleasant, and next morning early we shifted the camp down to an ideal place on the coast, on one of the platforms or terraces built with slabs of coral by the Banabans in the early days. Temati had said that they would let us have a hut for the use of our two native assistants and for stores. By the time our tent was pitched, we saw the hut apparently walking down toward us. It was being carried by four natives and was soon set up in position. A little flagstaff was erected in front of the tent, and there the first British flag to fly on Ocean Island was hoisted daily with its never failing message of cheer. The natives soon began to realize its significance, and it was pleasing to hear them referring to themselves as *Kain Engram* (English people).

A very interesting and particularly busy time followed. Investigations proved that the phosphate

deposit existed over the whole island, the area of which comprised about 1500 acres. In some places where there were more or less dense belts of coral limestone pinnacles, comparatively little phosphate existed, but it was certain that the tableland interior of the island contained a wonderful deposit. Some idea of the depth could be obtained from one or two deep pits dug by the natives previously in search of water, and holes were sunk by us in various localities proving that there were at least 10,000,000 tons, and probably three times that quantity. Figures sometimes cannot be quite realized, but a few months earlier we would have considered a find of 10,000 tons as being quite a bonanza. A few more tests with the portable laboratory demonstrated that no low-grade was to be found anywhere, so there was no need to worry about the question of quality.

A noticeable feature of the island was that soil, in the ordinary sense of the term, did not exist. All the vegetation was growing in the phosphate, the only other material on the island being the hard coral limestone, invariably existing in pinnacle form and constituting the bed-rock of the island. The phosphate more or less covered up these pinnacles according to the depth of the deposit. It was quite odourless, and in appearance when dry was like dusty grey or light brown gravel, with numerous water-worn pebbles. Here and there were masses of hard phosphate rock, sometimes weighing 50 tons or more. In some places on the northern and eastern sides of the island small pillars of high-grade rock

were found on the reef, washed by the tide each day; these pointed to extensive coast erosion in that locality.

So far as the deposits were concerned, everything was satisfactory, but lines of soundings which we took at various parts of the coast, using a canoe for the purpose, proved that no useful anchorage existed. It was apparent that the island was actually a mountain rising up from the ocean-bed, with the top above sea-level. This constituted one of the main problems to be faced; how could vessels be moored in a suitable position for loading without incurring undue risk?

It was soon evident that the bay which we named Home Bay, after one of the many picturesque coves in Auckland harbour, was the best site for our settlement; but the rivalry of the people of Tapiwa had to be studied. Partly for that reason, and also to facilitate shipping operations when the weather was unfavourable at Ooma, it was considered advisable to have a minor settlement there also. Lands for these sites were measured off and purchased, and areas for beginning work on the phosphate were selected. It was a novel way of starting business as a land and estate agent!

As the steamer which would later on bring the shipment of plant and tools for commencing operations would require some phosphate as cargo, a scheme was arranged by which a good quantity would be ready for her. The natives of the island were to collect the surface rock and stack it in huts

close to certain points on the coast where shipping would be possible. On arrival of the vessel they were to deliver it to the surf-boats and then be paid. This plan appealed to them and they began collecting rock with great energy, men, women and children. It seemed as if a magic wand had been waved, transforming an enforced idle community into an industrious one.

CHAPTER VIII

THE BANABANS

People of any race or colour inhabiting a small isolated island, and consequently thrown back on their own resources, are an interesting study. They seem to develop unusual lines of thought, and frequently display much originality and resource in contending with the adverse conditions under which their lot is cast. The Banabans are good examples of this type of development, particularly as I found them in 1900 before they had come into touch with civilization. In appearance they are brown-skinned smooth-haired people of good carriage and fine physique, though not possessed of the stamina characteristic of the white races. Their degree of intelligence is quite high, and they are of kindly disposition. A pleasing feature is their particularly keen sense of humour. Any genuine effort in that direction on the part of a European in his dealings with them is fully appreciated. Their Micronesian ancestors undoubtedly came from the Gilbert Group, many family connections with the Gilbertese being traced without much difficulty. Comparatively few changes have arisen in the language as spoken by the Banabans. No doubt their island was peopled through canoes getting adrift at the Gilberts,

in which case the prevailing trade-winds and the strong equatorial current would speedily sweep them westward to the longitude of Ocean Island only 250 miles distant. If they missed that island, they might reach the savage Solomon Group, some 600 miles farther west, but in that case their fate was quickly settled.

Such were the people with whom we were brought into close contact during the preliminary three weeks' stay on the island.

We held a number of meetings with the Banabans with the view of preparing to start operations; sometimes they were represented by the chiefs and on other occasions a good proportion of the community would attend. Through the interpreter, Temori, they were told details of how the phosphate deposits would be worked and how labourers would be brought from other islands for the purpose. They pondered the matter and then asked that Solomon Islanders should not be brought, as they did not want men living among them who might have eaten some of their ancestors. One old chief gravely asked what the labourers would drink, there being no permanent water on the island. On being told that we would bring machines that would make fresh water out of the sea water, they looked at each other as much as to say "If the white man can do that, he can do anything." Another of their requests was that we should not sell guns to them, in view of probable quarrels amongst themselves. One of their number who had somehow acquired a knowledge of pidgin-English then turned to me and said:

Photo: *A. F. Ellis.*

TENEWEGIA, THE OCTOPUS DIVER, COMING IN WITH HIS CATCH

BANABAN WOMAN PREPARING TO COOK CONGER EELS

"You got gun?" An answer in the affirmative was given rather shamefacedly. The fire-arms had been kept carefully in the background—they seemed so out of place among such a friendly people. "You bring him out, all man like see him shoot, plenty no been see gun shoot before." So the meeting was adjourned. Out came the gun and the crowd looked expectant. It had both rifle and shot barrels. The former was fired out to sea and as the bullet went ricochetting over the then calm surface they were much impressed. But next they wanted to see something shot, and they pointed to a dog which evidently was not of good repute. However, we demurred at despatching the dog, but probably with visions of grilled chicken in the background, we suggested that some of their fowls would be a suitable target. They took to the idea and the crowd followed to see what happened. Fortunately our aim was good and the prestige of the white man was upheld. The natives were satisfied with what the gun could do, and our evening menu contained a welcome change, grilled chicken *à la Banaba* being voted a good line.

A day or two afterwards there was excitement amongst the natives owing to an offence of the eternal triangle nature. One of the young landowners, evidently troubled with a guilty conscience, had kept close to our party all day and even asked for the gun to be brought out, which of course was not acted on. Next morning his hut was seen hacked to pieces, having been attacked by the injured party and his friends, who came down in full force; the delinquent owner

had previously beaten a hasty retreat to the bush, quite the natural thing to do under the circumstances. Several of his plots of land were confiscated and the incident was then declared closed. I learned afterwards that this was the usual way of dealing with such offences.

However, it was a well-behaved happy little community, generally speaking, among whom we lived—happy in spite of much physical suffering and misfortune. A repulsive tropical disease known as yaws had been rampant on the island for many years, quite crippling some of the natives with frightful open ulcers. An early edition of Findlay's *South Pacific Directory* comments on the then existing condition of the Banabans:

> Vessels needing refreshments cannot get water here. The island was probably in former times healthy and prosperous but now overcome by evils; the inhabitants, 450 in number, have fresh wants which cannot be easily satisfied.

This obviously alluded to yaws, and in the meantime it had doubtless become intensified, so that the villages literally reeked with the disease. We were pleased to be able to assure the Banabans that everything possible would be done to stamp out this scourge.

Another of their troubles mentioned at the meetings was the question of drinking-water. The only available supply consisted of small pools of soakage in the *bangabangas* in the interior of the island. It was the duty of the women to visit these caves each morning with torches and baskets of coco-

nut shells for the day's supply. But in drought times these pools were soon emptied and the women had to go deeper and deeper in search of others. On such occasions, so they informed me, mortality was caused by want of water, and one of the practices in their extremity was to go out catching flying fish at night merely to suck their eyes, which are exceptionally large and of a pronounced aqueous nature. It was not unusual they said for a piece of land to be exchanged for a single coco-nut shell of water.

Other serious conditions existed during prolonged droughts to which one of the later Resident Commissioners of the Gilbert and Ellice Islands Colony, H. W. McClure, refers in his book *Land-Travel and Seafaring* thus:

> So far as food was concerned, the people eked out a scanty and unhealthy existence on a diet of fish. The absence of any green food brought on scurvy and other ills. Many died of malnutrition; the female children were killed for economy's sake. Those adults that survived were so weak as to be unable to bury the corpses of the dead. At the last, a few handfuls of earth were all that concealed the decomposing bodies of the unfortunate victims. . . . Eventually of course the drought broke, leaving in its path a rock bare of vegetation and a people decimated by starvation and disease.

With the memory of such experiences, the Banabans would welcome any prospect of relief from these drought conditions and we were able to assure them that by means of tanks, cisterns, and if necessary condensers, they would certainly have a water-supply in future.

A further trouble brought into prominence at

those interesting early meetings was the fact of their poverty. Ocean Island was about the poorest place in the Pacific. The natives had no articles of trade other than shark fins, shark teeth swords, which were sold as curios, and relatively small quantities of fruit and vegetables. They were informed that all who wished to work could obtain employment when operations were begun, and a store would be kept where they might buy what they wanted. Also they would be paid for the phosphate, and we should buy for our labourers' rations any fish they might bring along.

We soon saw that the Banabans, as the result of their hard and strenuous life, were most expert fishermen, whether with their canoes and rafts, or when swimming along the reef with wooden floats and short hardwood rods. They would dive to the bottom and place the rod with its baited hook in a likely place, then put out a mouthful of chewed-up fish as an added attraction. Returning to the surface they could see in the clear water when the bait was taken, and then diving down again they would come up with the rod and fish, which after being killed by biting the back of the head, was tied to the float, and the operation then repeated. This unique method was used when the sea was too rough for canoe or raft fishing, as was frequently the case. Canoes would come in with one or two large sharks balanced across in an extraordinary way, seeing that an island canoe is about the easiest craft in the world to capsize. Shark was much appreciated as an article of diet, besides supplying the only articles of trade,

Photo: T. J. McMahon

"TE KARANGA" (NATIVE DANCE), OCEAN ISLAND

the dried fins meeting with ready sale in China, where they are used to make soup. The teeth of course were saved for making the shark teeth swords. The Banabans would even go shark fishing on their small rafts, little larger in area than an ordinary door. As a shark was hooked it would be dexterously played, and when close enough, killed with a small hardwood club always carried for that purpose, and then towed ashore. The fearsome octopus, which is said to be good eating, was caught by diving; the native seeing one on the bottom would go down after it, coming to the surface a writhing mass of octopus tentacles. A struggle would take place, and the fish, if such it be, would suddenly collapse, the native having succeeded in biting it in a nerve centre. The best octopus catcher was an elderly native, a bold spirit, Tenewegia by name. His chest and arms were scarred with old wounds where he had been bitten by their nasty parrot-like beaks. I asked him once if he were not afraid to tackle them in their own haunts, but he quite scorned the idea; afraid of *te geeka* (octopus), not he!

In addition to the main villages, Ooma and Tapiwa, there were two smaller ones, Tapiang and Puakonikai. Each village had its head chief, except perhaps Tapiwa, where there were other leading men beside Temati. There did not appear to be anyone of supreme authority on the island, but soon after we landed, an old woman came to the camp clad only in the customary *ridi*, yet she bore herself with such dignity and spoke to the others in such a way, that one felt she was of high rank. Nei

Tenemakin, or "the old queen," as she came to be known, was a picturesque character and she remained our good friend throughout.

Arthur Mahaffy, in the article on Ocean Island in *Blackwood's Magazine* November 1910, refers to Nei Tenemakin thus:

> She is a really remarkable old woman, with masses of snowy white hair, which fall about her strong and aquiline face. I have seen no finer type of Micronesian, and all the stories of the hardships endured, the struggles with unkind and niggardly nature, and the perils of a dangerous and barren ocean, which are told by the elder natives as matters of not unusual occurrence, become credible and probable in the light of that keen and resolute face, evolved from generations of these toilers of the sea.

Those early days on Ocean Island have left pleasant recollections of the natural dignity and innate courtesy of the older Banabans in particular. They were fine examples of nature's gentlemen, and though the struggle for existence on that frequently drought-stricken island, with its exposed and dangerous coast-line, had left its mark on their rugged features, there was much to admire in them, were they *Kiritian* or *Began*. No discordant elements occurred in our negotiations at the meetings already referred to. As the various points were agreed upon they always gave a hearty "*Ea tau*," which may be interpreted as "We agree. It is finished" —and they never went back on it. This does not infer that they were not capable of driving a bargain. In fact for natives, they had quite a gift in that respect, partly through natural intelligence, but also from their contact with whalers and other passing

vessels, when they had to get the best value possible for their scanty articles of trade. It is hardly necessary to say we were soon on very good terms with them, and when moving about the island their hearty "*Konamauri Miti Ariti*" (Greetings Mr Ellis) would be heard from one and all.

It might be supposed that the presence of so many curious natives about our camp would have proved inconvenient to us; that, however, was not the case. They appeared to know intuitively just when to come and when to go; at meal-times for instance, they would silently disappear. Another pleasing feature would be apparent as we moved about the island along the tracks which were only wide enough for single file. Any natives on ahead who saw us coming would at once stand aside, and follow on behind. Their natural courtesy was shown in this as in many other matters.

The time came for the *Archer* to return, and I arranged for Mr Naylor to remain on the island to maintain possession of the Company's interests, also to superintend the work of collecting phosphate rock. The chiefs willingly agreed to this and to take care of him; Nei Tenemakin declared that she would be his mother, and that alone was sufficient in view of her influence.

CHAPTER IX

"THE TRIVIAL ROUND, THE COMMON TASK"

THE Banabans were essentially a primitive people, and their daily life with its duties, their foods, and industries, were all on simple lines. Their island possessed so few natural resources that their ingenuity in utilizing the scanty material available was a very noticeable feature. We may take an imaginary stroll through one of the native villages as it existed at the time of my first visit, and observe something of what was going on as part of the day's routine.

Some of the women would be coming back from the morning's visit to the *bangabangas* to obtain the daily water-supply. They would be carrying baskets made out of plaited coco-nut leaves holding perhaps a dozen large coco-nut shells full of water, with leaves plugged into the "monkey eye" to keep the water from running out. Only the women went to the caves. The men were tabooed from doing so, and as the work of obtaining water there was so laborious, they were quite satisfied over the arrangement; it met their views exactly. There is frequently a good deal of method in this taboo business.

The Banaban mother having her water-supply would then take in hand the baby's ablutions, and the labour incurred in getting the water naturally influenced the amount used; a coco-nut shell full was invariably sufficient to provide the little chap with a bath, the chill being nicely taken off it by the method of application. He would be placed on a slab of coral outside the hut, and the mother taking a big mouthful of water would proceed to squirt a steady stream over him, meanwhile rubbing vigorously. Several more big mouthfuls and the operation was completed. Drying with a towel was not considered necessary in that hot climate. Anyway they had no towels.

A little farther on, two Banabans would perhaps be seen building one of their shapely canoes. The high prows of these craft and their fine lines made them both attractive and seaworthy. They were not dug-outs, but properly built with small tamana-wood boards, laboriously hewn from local timber. No nails were available, and in any case the strong coco-nut sinnet neatly laced along the plank edges was more suitable, and better able to stand the shock when the canoes were dashed on the reef by the surf, as was inevitably the case at times. They were of light construction and one capable of holding a crew of five could be readily carried down the beach and across the reef by two men. A canoe thus manned would make good headway against quite a heavy sea and the strong equatorial current; it was an invaluable item in the Banaban equipment.

Another Banaban might be seen making a shark

line from the fibre of the young coco-nut husk after having put it through special sea-water treatment. These lines were very neatly and strongly made, though to the white man's eye the hooks would not catch a shark at all. Originally they were wooden, shaped from a natural crook of very hard wood, grown locally. The advantage of the white man's metal was realized, however, and from a piece of thin bar iron a hook nearly circular was made, the point, which was never barbed, being turned in within an inch of the haft. In use, the shark would swallow the bait, and not be caught by the jaw in the white man's fashion, the hook taking its grip much lower down, and more effectively.

Some small fish-hooks might also be in course of preparation, the strands of a piece of old wire rope rigging and an old file being the only material necessary. The same shape would be used in this case also. Or perhaps a hook of the minnow type for catching bonito was to be made. For this a piece of opaque stalactite from one of the caves would be ground laboriously into shape, the hook portion of the minnow being made by fastening a piece of shaped bone at the desired angle. These were wonderfully effective for bonito fishing, and it is said they were unique, so far as other Pacific Islands are concerned. Perhaps another man would be making out of supple wood and coco-nut sinnet one of their cute and serviceable flying-fish nets, for use that evening.

Several Banabans might be building the frame work of a new hut, and again the valuable coco-nut

sinnet would be in evidence, lashing the ridge-pole and rafters in position, not a single nail being used. The frame work was mostly pandanus wood and the thatch would be pandanus leaves carefully doubled over a coco-nut leaf midrib and secured in a clever manner. It was the women's work to collect these leaves and make sections of the thatch ready for the men to fix into position. The huts usually did not have sides. The roof would come to within about three feet of the ground, thus permitting a free circulation of air. The floor was clean coral pebbles from the beach. Frequently two large slabs of coral rock would be placed in position near the hut, forming a sort of stone-age arm chair, one slab for the seat and the other for the back.

Near by a woman might be seen plaiting one of their sleeping mats, an important part of the feminine duties. Pandanus leaves were used for this purpose, usually being put through a curing process beforehand. These mats were laid on the floor of the hut, and others would do duty for covering over the sleepers in lieu of blankets. Another woman might be preparing torches from dried coco-nut leaves to be used for catching flying fish.

How would the torches be lit in this land where wax vestas or safety matches were never seen? The difficulty was soon overcome and again the produce of the coco-nut was in evidence. A man taking a piece of light dry wood, usually the giant hibiscus, two or three feet in length, would cut a shallow groove in it a few inches long, then rub a stick of harder wood backwards and forwards very rapidly

and vigorously in the groove. After a few such strokes, the sawdust then accumulated at the far end of the groove would begin to smoke. Then applying some frayed out coco-nut husk and gently blowing on it, the Banaban would soon have the larger piece of husk smouldering. This could be carried about as required and fanned into flame readily, or a remarkably efficient slow match was made by making a small roll of the rough sort of cloth which grows round the butts of coco-nut leaves.

Preparing pandanus for food was another important part of the women's duties. Outside each hut we would invariably see a number of "pancakes" drying, each about a foot in diameter. These were made from the soft part of the pandanus drupe or fruit mashed up into a fibrous mass which was subsequently powdered laboriously, and used in various ways. These pandanus food preparations were very wholesome and as the pancakes, or the sawdust as we termed it, could be kept for a considerable period, they constituted a reserve against the inevitable "rainy day," which on Ocean Island meant a drought period. Other food reserves for such a time were the coco-nut kernel allowed to dry into a hard ball inside the nut, and capable of keeping indefinitely, also the nuts of the wild almond. Apart from these, the sea could be called on for their food requirements, as the fresh coco-nuts, pandanus, paw-paw, and pumpkins, which constituted the ordinary household supplies, would soon become scarce under drought conditions.

BANABAN "FIVE-MAN" CANOE

NAURUAN FISHING CANOE

Amongst its multitude of uses the coco-nut supplies food for the young children, the meat of the nut in its soft pulpy state being quite suitable for that important purpose. In the later stages of its growth, when the meat becomes more developed, it is equally suitable for the older children.

The inherent hospitality of the Banabans would doubtless be shown at any of the huts we visited, and an offer of a *moimotu* (young coco-nut for drinking) would be courteously made. If accepted, as was frequently the case in that thirsty climate, the top would be deftly sliced off, so that the contents could be drunk straight from the shell. The milk of the coco-nut at that stage of its development was particularly good. On such occasions the correct thing was to say *Ko raba* (Thank you), to which the Banaban always responds *Te raoi* (You are welcome).

In the early morning or in the evening, some of the men or older lads would be seen climbing up certain coco-nut trees with a series of notches cut into each side. By means of these they simply walked up the trunk of the tree as rapidly as if walking along the ground, and would then proceed to cut the toddy. This was done by severing the florescence of the palm, then binding up the cut portion with the invaluable sinnet, thus promoting a flow of sap which was led by a leaf funnel to a coco-nut shell suspended underneath. Each morning and evening these shells of sweet toddy were removed, and lest the man thus engaged on the top of the coco-nut tree should lay himself open to the accusation of being a "Peeping Tom" as to what was

going on in the vicinity, he would always chant in a sonorous voice to make his presence known. Sweet toddy was a very valuable and nourishing article of diet to the Banābans, almost as useful to them as bread is to us.

An old man might be seen in one of the huts making shark teeth sticks or spears for bartering when the next trading vessel arrived. Quite a lot of fancy work was put into these weapons, fine twine made from the women's long black hair being largely used. As real curios these did not rank high compared with the old-time long-handled shark teeth swords as used by their Gilbertese ancestors.

It must not, however, be supposed from this description of local industry that the Banaban community was a hard-working and industrious one. Every native at work would have two or three opposite numbers either asleep in the huts or taking it easy near by. In common with the Gilbertese and other Pacific Islanders, they cannot understand why the white man spends his life working, in fact, though too polite to say so, they consider he is quite mad on the subject of work. The women were probably more industrious than the men, all the household duties falling to their lot, but they, too, always had time for the latest bit of local gossip, each hit being greeted with boisterous and appreciative laughter; doubtless also there were styles in *ridis* to chat over, for sometimes even these primitive garments would be worn with an air suggesting that they were considered to be the latest thing.

Frequently several of the older men would be

seen squatting on mats in the *maneaba* (meeting-house) gravely discussing matters of local import. At such times it was quite improper for one of the young fellows to enter the building, and, if wishing to speak to the others, he would wait outside until they had finished or until they invited him in. There was a considerable observance of etiquette in connection with formal meetings in the *maneaba*, the deference shown to the older people being very marked. A young fellow on entering would not think of walking erect when passing a group of elderly folk; he would bend nearly double as he moved past in an almost apologetic manner. During the proceedings, precedence was given to the married people; they ranked higher than the unmarried and did not hesitate to let the young fellows know it at times. Each family had its special position in the building, handed down through successive generations.

After talking over things in the *maneaba*, probably one of the men would produce his pipe and light up; a few deep whiffs and he would pass it on to the next, and so on round the group, a sociable procedure, if not altogether hygienic. When clad only in their *ridis*, the pipe and plug of tobacco were carried in their ears. It was customary for these to be pierced in their early life and a piece of pandanus leaf inserted in such manner that the hole was gradually enlarged, sometimes reaching extraordinary dimensions. If the pipe and tobacco were in danger of falling out, several twists of the lobe would be given to tighten things up. At other times yellow leaves were thus carried

as ornaments, so later on they were not very surprised at finding that some of the white women wore earrings. The first sight of gloves, however, filled them with amazement, and a young fellow rushed up to the doctor to tell him that a captain had just come ashore with boots on his hands!

As the afternoon waned some of the older men would doubtless stroll down to the beach to see the canoes come in with their catch of fish. The women too would be sitting about to see what success had attended their husbands' efforts. If a good big shark was brought in, they were round it with their knives like a cooper round a cask, and in quick time the various native ovens would be going. The method of cooking fish was in true South Sea island style. To make an oven, a shallow hole was scraped in the ground and a fire laid with numerous round pieces of limestone on top of the wood. When these stones were well heated, the remains of the fire were removed, and the fish, wrapped in the large leaves of the jackfruit, were placed on the hot stones and covered up with more leaves and coco-nut mats, the whole being well weighted down with pieces of limestone to keep the steam in. No further attention was necessary, and in two or three hours the fish were nicely steamed, when the family would sit around and have their one big meal of the day.

Sometimes the canoes would come in with a good catch of *te eti* or bonito, a thickset dumpy fish of about 10 pounds weight, caught in great numbers with a rod and line, using the special bonito hook. Or perhaps it might be a *te baara*, a large fish some-

what resembling barracouta; this fish has very powerful jaws and teeth, capable of easily biting through any ordinary fishing-line. The Banaban, however, lures it through a noose which is then pulled tight and the fish hauled in ignominiously, tail first. Such procedure might not be called sporty, but actual necessity knows no such law, and in any case the native has his own point of view. For instance, he cannot understand why the white man should go out fishing when not feeling hungry.

A busy time in those days was the annual visit of shoals of sardines to the island in such numbers that two canoes, using a net which was let down between them a few feet, would be half-filled with fish in a short time. They were spread out on mats and thoroughly dried in the sun, after which they were pounded up and preserved in long rolls of pandanus leaves, affording a useful food reserve. When used, the powdered material was put in water, thus making a rough soup. During these fish-curing operations, as may be imagined, the whole village was pervaded with a particularly ancient and fish-like smell.

One of the few changes of diet that the Banaban had in those days might be an occasional coco-nut crab. Apparently these remarkable crustaceans never had the chance to become very numerous. Shaped something like a lobster, they grow to an enormous size, sometimes weighing eight pounds, and with sufficient strength and ingenuity to tear the husk off a coco-nut, which is not easy for an able-bodied man unless he knows how to do it. A point of one of their powerful pincher claws would then

be inserted in the "monkey eye" and sufficient shell could be readily nipped off to open up the contents. The crab carries on this operation at night, and if he cannot find a coco-nut on the ground, he climbs a tree and speedily drops one by nipping through the tough stem. He lives in a well-concealed hole and is not difficult to catch when once seen, but woe betide the man who carelessly comes within range of the vice-like pincher claws.

If our stroll took us down to Sydney Point, a picturesque spot which I had named after one of Mr Arundel's daughters, we should probably see several Banabans near the wooden frame work on which the tame man-of-war hawks or frigate birds would be perched. These remarkable birds with a six-foot spread of wing and body no larger than that of a small pigeon, are kept as pets and also to serve as decoys for snaring wild birds. The Banabans are very expert at this, using a long length of line with a plummet attached. This is thrown over the wings of an approaching bird with immediate effect.

On one occasion when at Sydney Point I saw several Banabans watching a gannet which was circling around. Suddenly it came within range, and simultaneously three lines shot out, all falling across the wings, and in a few seconds it was squawking on the ground. The man-of-war hawks are fed with fish thrown to them while on the wing, and it is a novel sight at feeding-time to see these remarkable birds going through their gyrations. In their wild state they are birds of prey, and soar aloft watching for some unfortunate gannet or booby coming home

with its catch of fish. The man-of-war hawk then swoops down and harries it in various ways until the fish are disgorged in mid-air, the hawk catching them before reaching the water.

What about the small boys we might expect to see during our stroll through the village? Happily the species is much the same all over the world, whatever the colour may be. On Ocean Island they seemed to become half fish in their habits as they frolicked about in the surf, going through all sorts of performances, and gaining the experience which would stand them in good stead in later years. Perhaps they might get the idea that the white man had some special programme on, and then a small crowd would collect and follow to see what happened. Nothing seemed to escape their bright eyes.

A learned and much travelled friend of mine said that when he landed on any of the Gilbert and Ellice Islands, he was always followed by a crowd of small boys who bestowed on him the same meticulous attention to details that we usually devote to some rare specimen. At our first camp on the island we always had two manly little fellows to flick away the flies while we were having our meals, and to help our Niue cook, Toopi. They were the envy of all their chums, with their close opportunities of seeing the customs and behaviour of the *rara avis* which had come to their island. Besides, did they not have the privilege afterwards of eating some of the same wonderful food that the white men had?

If the tide was low, the boys might be out on the reef with little bows and arrows, shooting small fish

in the pools. The island sea water is of course perfectly clear and quite different from the comparatively discoloured water of civilization. Or the boys might be practising in miniature the art of snaring man-of-war hawks. One would throw something high into the air, and simultaneously four or five small plummets with lines attached would shoot out and usually reach their mark.

In the matter of family life it may be of interest to say that in my long experience with these and other Pacific Island natives I have never seen any one of them strike a child, even when, from our point of view, something in that line was well deserved.

During the afternoon a group of adults might hold a *ruoia* (native dance) in the *maneaba*. The Banabans and the Gilbertese never seem to tire of this most remarkable dance. R. L. Stevenson was evidently fascinated by it, and in his book, *In the South Seas*, says:

> But the Gilbert Island dance leads on the mind; it thrills, rouses, subjugates; it has the essence of all art, an unexplored imminent significance. . . . But they begin as children. A child and a man may often be seen together in a *maniap*, the man sings and gesticulates, the child stands before him with streaming tears and tremulously copies him in act and sound; it is the Gilbert Island artist learning (as all artists must) his art in sorrow.

Personally I must confess to not having seen so much in the *ruoia* as this, but R.L.S. had the seeing eye in such matters.

We might see tonsorial operations going on outside one of the huts. The men wore their hair fairly

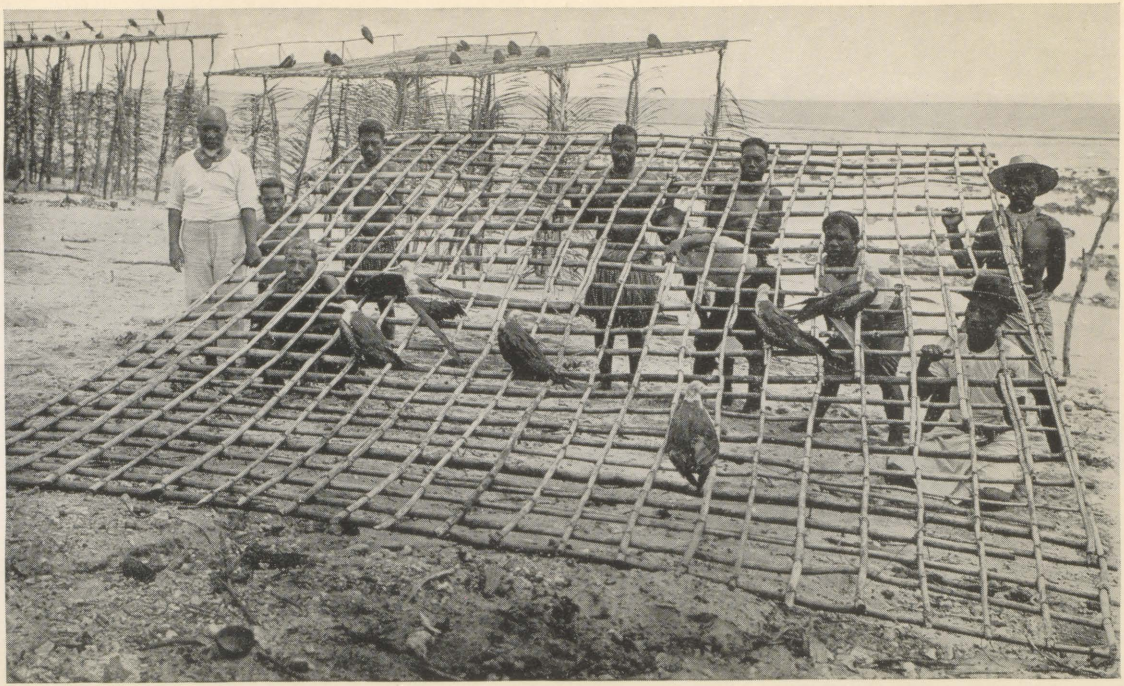


Photo: T. J. McMahon

NAURUANS WITH THEIR TAME MAN-OF-WAR HAWKS

long, and in the absence of scissors, any cutting or trimming was done with a piece of broken bottle glass having a bevelled edge. With sharp downward strokes the locks of hair would be cut off, the glass doubtless being considered a wonderful improvement on the procedure before the advent of the white man. In those earlier times the surplus hair was hacked off with a large shark tooth. The men did not wear beards, and the custom in lieu of shaving was crude and painful, but fortunately it did not require to be carried out frequently. With her husband lying back in an easy position the Banaban wife would get to work with a stout spine of the sea urchin sharpened to a chisel edge. Each bristly hair in succession would be seized between this edge and her thumb-nail and be tweaked out by the roots. A slow process, but time was no object.

The evening falls on the village, and not far away the conch-shell horn is sounded several times from the native teacher's house, the call to evening prayers.

After the evening meal some of the canoes would be going out to catch flying fish, and a white passenger might be given a seat with the three or four natives comprising the crew. Two of them would paddle slowly along the reef just beyond the line of surf, the torch flaring, and a native in the bow armed with a small oval-shaped net on a long pole would scoop up the fish one by one as they came within reach, attracted by the torch but dazzled by its glare. The unusual conditions, the proximity of the surf, and the eerie effects of the blazing torch, the excitement of the fish flying about, and the rapid

manipulation of the long-handled nets all contributed to making it a fascinating experience. The fish are about 15 inches in length, two of them being sufficient for a man's breakfast, about four or five dozen constituting a fairly good catch for a canoe.

The time would be perhaps 10 p.m. when the last of the canoes came in with their catches, and as these Banaban toilers of the sea wended their way homewards, silence would reign throughout the village, broken only by the never ending murmur of the surf on the reef, and the rustle of the coco-nut leaves overhead.

Our stroll through the village has been more extensive than we had anticipated, but we have seen something of the everyday life of the Ocean Islanders as it existed when the *Archer* landed us on the beach in 1900.

CHAPTER X

FIRST PROSPECTING TRIP ON NAURU

THE *Archer* returned to Ocean Island on 27 May, and I rejoined her in a much easier frame of mind than when we had gone ashore twenty-four days previously. Another step in the great adventure was eagerly looked forward to when we arrived at Nauru the following day. With its wealth of coco-nuts and considerable copra industry, together with the presence of European residents, the island did not seem anything like the *terra incognita* that Ocean Island was; nevertheless visits from vessels were not at all frequent. Going ashore, we were soon surrounded by an excited crowd of natives, none of whom seemed able to talk English. The Company's trader, Sam Halstead, had a good deal of copra ready for the *Archer*, the supercargo started weighing in, and shipping operations were soon in full swing, men, women, and children getting on the job in good style.

We had decided to ask permission from the German District Officer, Herr Kaiser, to go out prospecting, and accordingly called at his office for that purpose. He could not talk English, but through a local trader, Mr E. Stephen, informed me that there was nothing in the way of phosphate or guano to

be found on the island; that German warships called there regularly with scientific men on board, and they would have known had any such deposits existed. Mr Stephen then suggested there might possibly be some guano in the interior where there were considerable numbers of seabirds, at which I expressed a desire to visit the place, and no objection was raised. On my return to the scene of shipping operations, Halstead supplied me with native guides, three good-natured lusty fellows. However, they could not speak a word of English, so communication had to be effected somewhat in the same way as the procedure customary when one crosses from Dover to Calais.

We struck across the four hundred yards or so of flat sandy country, covered with coco-nuts, and then up a sloping hill to much older formation, similar to that of Ocean Island, and with evidences of phosphate everywhere. One felt instinctively that the deposit existed over the whole of the elevated interior, and that it must constitute the largest deposit of high-grade phosphate yet found.

This preliminary examination impressed me much more than the result of my prospecting on Ocean Island, where there was no elevation from which one could get an extensive view of the phosphate area. At Nauru there were numerous hills, and from the tops of these, almost as far as the eye could see, stretched a wide expanse of phosphate country. The immensity was impressive; it was the sight of a lifetime in my special line of business. Walking along the track chipping off specimens with the prospecting

hammer here and there, and testing them with acid, was an experience which seemed like a glorified version of the couplet of one's schoolboy days:

> I'm on Tom Tiddler's ground
> Picking up gold and silver.

Prosaic material one may say for such a simile; but it all depends on the point of view. Here was material in scores of millions of tons which would "make the desert blossom like the rose," would enable innumerable hard-working farmers to make a living, and would facilitate the production of wheat, butter and meat for hungry millions for the next hundred years to come. One could visualize a great industry springing up on this lonely spot, quite dwarfing all of our previous efforts.

We were tempted far into the interior of the island, excited and engrossed in the experience. The tropical sun was pelting down, we had no water, nor were there any coco-nuts in sight for drinking purposes. Just when I was feeling about done up, to my great surprise and delight we came on a patch of ripe water-melons, which quite saved the situation, and finding them appeared providential as no more were seen during the rest of that memorable journey. Subsequently we learned that the custom of the Nauruans when raising water-melons is to set fire to a tree and drop a few seeds in the ashes when cold. No further cultivation is required, but it is necessary to grow them a long distance from the villages, otherwise the ubiquitous island pigs get the melons.

The Nauruan guides were at first interested in the prospecting operations, obviously a new experience for them, and they were noticed going into bursts of laughter after some facetious remark one or other would make. On returning to the settlement the guides, who were very voluble, gave the local missionary, Rev. P. Delaporte, an evidently amusing account of what happened on the trip. He told me months after, when the discovery was made public, that they had described the white man from the steamer as being quite mad; that he kept picking up stones, dropping medicine on them out of a bottle and putting them in a bag, scraping holes in the earth and again wasting medicine; quite mad! A Nauruan name meaning "the stone man" was given to me there and then.

How was the discovery viewed through German eyes? In a small book written in German and printed by the Nauruan Mission Press in October 1913, the author, Dr K. E. Kretzschmar, as translated, states:

> Active trading was done with Nauru in the years following its possession by the German Empire, and even before that it had been frequently visited by white men. Nevertheless, nobody had the least suspicion of the nature of the precious soil into which the roots of the cocoanut palms were thrust, nor the value, to be reckoned in millions, that was embedded in Nauru. It was an accident that revealed this treasure.
>
> One of the senior officers of the Pacific Islands Company was, at one time, on Nauru in order to establish trading relations. While there he came across a specimen of remarkable structure which he took to be petrified wood. He took

this away to show his friends in Sydney. After they had duly admired it, the specimen followed a quiet existence as a door-stop, and fulfilled its destiny for a time by keeping open the door of the laboratory.

It was shortly after this that Ellis, a phosphate expert of the same Company, returned to Sydney after a round trip undertaken with a view to locating phosphate deposits. Like so many before him, all unsuspecting he passed by the door-stop. It was not long, however, that as he went to and fro on his work in the laboratory, his attention was directed to the silent, unobtrusive stone at his door. For three months the presence of the stone more or less exasperated him, getting between him and his work, until he finally determined to put an end to the matter. He chipped off a piece and analysed it: the world-famed Nauru phosphate was discovered.

The natives of this island, numbering about 1400, impressed me very favourably with their pleasant appearance and friendly manners, quite justifying the opinion held by the man who first discovered the island. They were obviously a healthy community, and though living under primitive conditions as regards their huts and clothing, they were evidently well fed and none the less happy for being without luxuries. There was no evidence of the strenuous struggle for existence which was so noticeable in the features of the Banabans, particularly the older men. With their wealth of coco-nuts the Nauruans were able to keep a great number of pigs, and though of a type we call in New Zealand "Captain Cook-ers"*

* When the great navigator Captain Cook visited New Zealand, he left some pigs with the Maoris. The breed gradually deteriorated and many of their progeny reverted to the wild pig type, with long snouts and legs, shaggy hair and bushy tails.

they afforded a very useful occasional meat diet, besides being a very good article of trade with passing vessels. In this they had an advantage over the Ocean Islanders, who did not keep those useful animals, probably owing to the uncertain water-supply. The Nauruan language was quite different from the Gilbertese as used on Ocean Island, and differed also from that of the Marshall Group to the northward, though many words were similar in all three languages.

The *Archer* continued her trading voyage that evening, bound for the Marshall Group, then of course under German rule. Several islands were called at, including Jaluit, the seat of administration. We were informed that the German doctor at the hospital, where patients were collected from all parts of the group, was particularly successful in treating the native disease which was such a scourge on Ocean Island. We accordingly called at the hospital and Dr Bartels kindly and courteously gave full particulars and actual demonstrations of the treatment. What was seen at the hospital that morning before breakfast was too much of a strain, however, and the good doctor had an extra patient for a short time.

Apart from the invaluable information gained at the hospital, the feature which most impressed me during the *Archer's* short stay was the practical demonstration given of what the human frame could actually absorb in the way of lager beer. Any unfortunate German who could not take at least two dozen large bottles during a beer evening was looked down

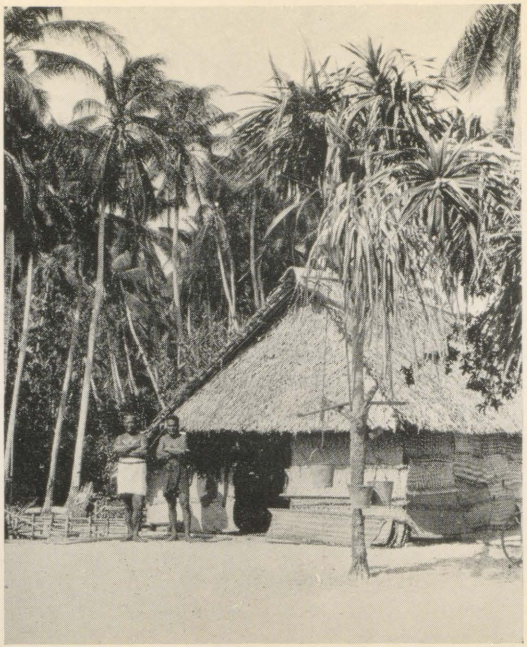


Photo: Prof. W. J. Dakin

NATIVE HOUSE, NAURU

Photo: Prof. W. J. Dakin.

COURT HOUSE, NAURU

on by his friends and associates as not being "an officer and a gentleman."

There was a wild and woolly scene the evening when the *Archer* took her departure from Jaluit for Sydney. A young German was leaving by her and the residents came off in force to farewell him, bringing the inevitable cases of lager beer with them. What followed proved altogether too much for their friend's equilibrium. Next morning he apologized to us with many smiles and gesticulations, and explained in broken English that it wasn't the lager beer at all. Good lager couldn't have such an unkind and demoralizing effect. He shook his head vigorously at the bare idea of it. Earlier in the evening other beverages with more kick in them had been partaken of, and mixing the liquors had proved deadly.

PART II

DEVELOPMENT OF ISLANDS UNDER PRIVATE ENTERPRISE

CHAPTER XI

PIONEERING ON OCEAN ISLAND, 1900-1

THE *Archer's* long trading voyage at last was over, and I was not sorry; she was a good little vessel as island traders went in those days, but her passengers were invariably of opinion that she would roll in a dry dock. With a full cargo of copra and bearing news worth many such cargoes, we duly arrived at Sydney where we were met by the Deputy Chairman, Mr John T. Arundel, and Mr A. H. Gaze, Senr. Changes had taken place in the Sydney office, and the latter had been sent out by the London Board as the Company's representative. Both gentlemen were naturally anxious to hear the results of the prospecting on the two islands for there was no wireless in those days to send the news on ahead. The whole position was carefully considered in the light of the existing conditions.

It was decided to start work at Ocean Island forthwith, using the plant from the last place worked off the Queensland coast, North-West Island in the Capricorn Group. This plant had done duty on several other islands previously, and was naturally very much the worse for wear. Practically no new material was purchased; the overdrawn state of the bank account would not permit of it, and we had to

demonstrate that there was money in the new venture before the purse strings could be unloosed. If our engineers at the islands nowadays were supplied with material similar to that which Ocean Island was started with, they would doubt the sanity of the buying department in Melbourne office, or to be more correct, they would not have doubts on that subject. The plant was mostly fit for the scrap-heap, the timber for firewood, and much of the rest for the rubbish-tip, excepting the provisions of course, which were always of good quality.

The programme was that, accompanied by my brother George and a staff of five, I should proceed to Ocean Island per s.s. *Titus* (Captain Cargill) calling at the Ellice Group *en route* for the purpose of engaging a native labour force of about thirty. After landing the plant at Ocean Island, the vessel was to go on to Baker Island where Captain Theet with a small staff and a gang of Niue labour was stationed. He had rejoined the company after some years of absence, and had been working the island for the second time, taking lower grade material than had been shipped previously. The captain and his men were to ship several hundred tons of phosphatic guano and then load the Baker Island plant aboard the *Titus*; they would then come down to Ocean Island, joining up with us there, and the vessel would complete her phosphate cargo. To start shipping so early was obviously expecting a great deal, but it was imperative, not only by way of bringing in some money, but also in order to introduce the

new class of phosphate to the fertilizer manufacturers, and enable them to ascertain its suitability for making superphosphate.

Arrangements were made accordingly, and the *Titus* duly reached Ocean Island on 28 August 1900, which may be considered a red-letter day in the history of the island. Mr Naylor reported on our arrival that everything had gone well, the Banabans having collected several hundred tons of phosphate rock. The *Titus* was discharged as quickly as possible in Home Bay, not easy work in those days, as it had to be done while the vessel was under way. It was duly completed, however, and she took her departure for Baker Island on 5 September.

A start was soon made at erecting a store for the provisions and perishable goods, also at building a jetty of the same type as was used on the other islands. The latter was to extend across the reef about 100 yards, on high piles so that it would be above the surf, thus providing for the phosphate to be loaded into lighters of the surf-boat type, lying in the smoother water just beyond the reef.

Most of the native labourers, usually called kanakas throughout the Pacific, were set to work breaking up some masses of rock phosphate within 50 yards or so of the jetty site. They were of course quite new to this work and had never seen such things as spalling-hammers, picks and drills, and as for blasting the rock with dynamite, it quite filled them and the Banabans with amazement. One of them, told to shift some rock with a barrow, duly loaded it up, and then walked round it in perplexity,

finally lifting the whole thing on his shoulders and walking off with the load.

Meanwhile we Europeans, and also the kanakas, had to live in native huts or under tarpaulins, making the best of the inevitably uncomfortable conditions. Things would not have been so bad had our health kept good, but an outbreak of what is known as "Line Island fever" took place, and most of us went down with it. This particular fever is not a dangerous type, but is of a persistent nature and very depressing while it lasts. To make matters worse, the *Titus* arrived from Baker Island on 12 October with Captain Theet and his staff and Niue labour, but all the latter were on strike, demanding to be taken home, when, so they said, another gang could be engaged to work Ocean Island. Captain Theet brought the ringleaders ashore to see me the following morning at a time when I could hardly hold my head up with the fever. They were defiant, ignored the terms of their agreement, and obviously nothing could be done with them.

It seemed as if the bottom had dropped out of things, when the cry of "Sail-ho" went up, and quite unexpectedly Mr Arundel arrived in the s.s. *Victoria*. His visits to the islands were always welcome, but never so opportune as on that occasion. The position was discussed and it was decided to change the class of labour forthwith; the Niues were to be sent back in accordance with their demands, but no more would be engaged, and they were not to be allowed ashore while the *Titus* was completing her loading. In effect they were tabooed, and soon

became very sorry for themselves, particularly when their supply of tobacco ran out.

Meanwhile my brother and I were to proceed in the *Victoria* to the Gilbert Group and endeavour to recruit a number of Gilbertese. These natives had never been tried at phosphate work before, but I had seen a good deal of them a few months previously when aboard the *Archer en route* for Ocean Island, and was favourably impressed with their possibilities as labourers. On that occasion Mr W. Telfer Campbell, the Resident Commissioner for the Gilbert and Ellice Islands Protectorate (since become Colony) had also been a passenger, and at the various islands called at, he kindly invited me to accompany him ashore when his official visits to the chiefs and the *kaubure* (native council) were being made. This gave one a considerable insight into the character and habits of these remarkable Micronesians, who are graphically described by R. L. Stevenson in the latter part of his book *In the South Seas*.

The foregoing plan was duly carried out. We left in the *Victoria* on 16 October for Tarawa, the seat of administration, obtained from the Resident Commissioner a licence to recruit labour, then on to Nonouti where Mr G. M. Murdoch, District Officer, joined the vessel as government agent, and a local trading celebrity—Jimmy Gleeson—was taken on as recruiter. Mr Murdoch knew the Gilbertese as no one else did, and his experiences with them extending over many years would make a fascinating story. At Nonouti, Tabiteuea, and Nikunau, we recruited

all the "boys" required—76 fine strapping young fellows, excellent raw material. Before Mr Murdoch left us he gave much useful advice and information regarding working this new labour, also maintaining law and order.

The last evening at Nonouti was spent pleasantly in exchanging our various island experiences. Mr Murdoch in earlier years had, through force of circumstances, been closely associated with the tyrannical native potentate, Tem Binoka of Abemama, in the Central Gilberts, whom R. L. Stevenson describes most interestingly in his book, already mentioned. Some further sidelights on this remarkable character, who lived with a Winchester rifle in his hand, were narrated by Mr Murdoch, closing with a vivid account of certain incidents at his interment. This led to Jimmy Gleeson contributing the following account of the funeral of a brother trader, the only white man on a neighbouring island. He had passed away suddenly, to the consternation of the natives, who realized, however, that the onus was on them to conduct the interment according to the white man's custom, of which they had some vague idea. They knew that a "box" should be provided, and that there should be a procession conveying it to the grave. A rather frail one was duly made out of the only timber available, some tinned-meat cases, with the labels still left on, reading funnily in view of their new purpose, and in due course the procession set out for the grave with great solemnity befitting the occasion. The primitive coffin was carried on the shoulders of four strapping natives. Unfortunately

one of them tripped, the box fell to the ground, burst open, and the disastrous result can be imagined. This was too much for the pent-up feelings of the natives, ever ready to see the funny side of things. They sat on the box and went off into fits of laughter. In due course they came to themselves and carried out their duty. This incident is characteristic of the way the Gilbertese go suddenly from one extreme to another.

The *Victoria* arrived at Ocean Island on 28 October, having been absent only twelve days, a very short period compared with what would have been necessary to engage a new batch of Niues. In addition to being a labour-recruiting trip, it had proved a health-recruiting trip for my brother and myself. We found that the *Titus*, with the valuable help of the Banabans, had discharged the Baker Island plant and loaded nearly all the phosphate she could take—78 tons. The work had been done slowly and laboriously, the boats having to take their cargoes over the reef and through the surf, necessitating tide work. She left shortly after for Niue *en route* for Sydney, taking from Ocean Island the first shipment of phosphate, small though it was. This, and also the arrival of the first Gilbertese labour constituted epoch-making events in the annals of the industry.

The building programme at Ooma settlement progressed steadily, and living conditions gradually became more comfortable for all. Captain Theet and his men with some of the new labour started

similar construction work at Tapiwa, and altogether Ocean Island began to look a busy spot.

The building of the jetty was completed by 19 November, under three months from the time we had landed at the island. A tramline was laid from the stocks of prepared phosphate down a steep curving grade to the inner end of the jetty, and along its full length. The time had come for trying out the arrangements, and many of the Banabans had collected on the higher ground, adjacent, to see the wonderful things the white men were going to do. I did not quite like the look of that down grade, and suggested that the first truck should be started off with the wheels "spragged," but the man who had done the work was confident that the 100-yard length of jetty would arrest the speed of the truck. He was a Scotchman, and men from "north o' the Tweed" usually have the courage of their convictions, so the truck was loaded up with two tons of phosphate and sent off. It took the grade safely, but gathered so much speed that it raced along the jetty at a great rate and went clean over the end into deep water, narrowly missing the surf-boat which was awaiting its contents. The incident was too much for the crowd of Banaban onlookers. They fairly rolled on the ground in their boisterous mirth, and this was naturally joined in by the kanaka labourers who one and all looked on it as a joyous incident. It could not have been more appreciated had the scene been staged for their benefit. The feelings of the whites could be imagined as operations were started for the recovery of the truck.

However, the arrangements worked fairly satisfactorily afterwards with the truck wheels "spragged," though it was not until a hopper had been built at the inner end of the jetty, thus doing away with the curving down grade, that good work relatively could be done.

A set of moorings had been laid after a good deal of difficulty, and with the vessel lying at these, shipping was much facilitated, but during the early years of operations we were much hampered by the moorings carrying away in rough westerly weather. Until they were repaired or relaid, loading had to be done to vessels while under way, a difficult and somewhat dangerous operation, both as regards the safety of the vessel and also of the surf-boats. So far as the kanaka boatmen were concerned, they were like fish in the water, and the incident of a capsized boat was nothing to them. The rate of shipping was steadily speeded up. At first the phosphate was shipped in bags which were emptied and returned for filling. This laborious method was in accordance with previous practice on the other islands, where, however, the material was of a different and much more dusty nature. It was soon realized that shipping in bulk was the proper system, and as soon as possible the change-over was made. The plan adopted was for the new side delivery trucks to discharge into a hopper at the end of the jetty. From this the phosphate travelled down a shoot into four large baskets holding about 15 hundredweight each in the body of the boat. When alongside the vessel these baskets were hove-up separately by the steam

winches, then emptied down the hold and returned to the boat for refilling.

It soon became evident that in order to get low freights, larger vessels than any yet dealt with must be loaded, and the improvement in shipping arrangements permitted of this being done. The first large vessel was the s.s. *Moonstone*, but after we had put 2270 tons aboard she had the misfortune to run on the reef at Sydney Point early in the morning of 27 July 1901 when she was steaming in towards the loading berth, and sank the same evening. Other large vessels were chartered and sent up, and the size gradually increased to the tonnage of about 3500 tons then considered the limit for the conditions existing at the island.

As to the quantity of phosphate shipped during this period of pioneering, the amount was 1550 tons in our first four months on the island, and 13,350 tons in the following year. It was still "the day of small things," but we were definitely on the upgrade.

Meanwhile the phosphate workings were steadily extended at both settlements, new areas being acquired. The material had to be shipped in a dry condition, and at that time we depended entirely on sun-drying, the procedure being first to remove the vegetation and a little surface rubbish; then loosen up about three inches of the surface of the deposit, and keep stirring it about until dry. The phosphate was then collected, and by means of barrows loaded into trucks which were run along by small steam locomotives to the storage bins. Frequently, how-

ever, the day's work would be lost by a sudden downpour of rain just when the phosphate was dry enough for collection.

What of the Banabans during these times which must have appeared so eventful to them? One of the most cheering features of those early days was the response to medical treatment made by natives who were afflicted with yaws. The procedure consisted in rubbing the limbs with a certain strong drug, one limb being treated each day, and taking heavy doses of special medicine. Large quantities of these necessities had been brought up from Sydney. Every morning the Banabans to be treated lined up at our settlement, and in a fortnight or so beneficial results became apparent. Within three months the disease had been practically stamped out, some of the cures being remarkable. The relatives of one young fellow who could only crawl round on all fours, and who was supposed to be too far gone, had asked for supplies, and then started the treatment on him. In a few weeks he reached the stage of using crutches, next a walking-stick only, and soon quite recovered. For many years subsequently he held the reputation of being one of the best fishermen at Ocean Island.

Somehow the ubiquitous fox-terrier has often figured in pioneering experiences, and our two dogs, Reggie and Topsy, used to afford us a good deal of welcome diversion in those early days. They had been with us on previous islands, but I had some doubts about bringing them to Banaba, as the natives had a number of big mongrels which, unlike their

owners, did not take kindly to the advent of the white man. However, we decided that the foxies would have to take their chance, and as things turned out, there was no need to worry about them. They constituted themselves the guardians of the camp so far as other dogs were concerned, and their tactics with any canine intruder were always the same: a simultaneous rush, one attacking in front, the other in the rear, the big dog spinning round like a teetotum, snapping first at one and then the other, then starting to retreat, when Reggie would administer the "knock out" in the form of a lightning charge. All would disappear at full speed down the track, the big dog howling with fear, and the foxies yelping with the excitement of the chase.

A great event in 1901 was the hoisting of the flag. When the adjacent Gilbert and Ellice groups were proclaimed as British Protectorates in 1892, Ocean Island was not visited by the warship, possibly because it was 250 miles away, but doubtless also because its value from a commercial point of view was then practically *nil*. In view of its new-found wealth, however, the London Board made urgent representations in the proper quarter, with the result that on 28 September 1901, H.M.S. *Pylades*, under the command of Commander R. G. O. Tupper (subsequently Admiral Sir Reginald Tupper) with the Resident Commissioner, Mr W. Telfer Campbell, on board, arrived in Home Bay. The commander with his staff in full uniform and a squad of blue jackets in tropical rig came ashore. The Proclamation was read and the flag hoisted on the

Company's flagstaff at Ooma settlement, with all due ceremony. A salute of twenty-one guns was fired, to the intense interest of the Banabans and kanaka labourers, one and all of whom appeared to be wondering as to what would happen next. Commander Tupper and his officers had a good look round the settlement and villages, and were obviously interested in the new addition to the Empire. The doctor was favourably impressed at seeing what was done among the Banabans medically, and gave some useful advice, particularly in regard to an unfortunate Banaban commonly referred to by our staff as "the gentleman without the nose," a man whose face was one big open sore. In due course this man also recovered, excepting as regards the missing organ which was irrevocably gone.

In a book entitled *Reminiscences* written by Admiral Tupper after his retirement from the Navy, he says:

> I was also interested in the recently discovered phosphate deposits on Ocean Island which have since attained such colossal importance. I sent plans of the island to the Admiral for the Government, for at that time the riches of the island, although being worked, were not properly recognized by the people at home. On my report, and at the request of the Pacific Islands Company, I was ordered to hoist the British Flag on Ocean Island, and duly performed the ceremony on September 28th, 1901. I had to concoct a Proclamation, but I have no copy of it.

This important and historical document is now framed and hanging up at the Residency, Ocean Island.

CHAPTER XII

THE TURN OF THE TIDE, 1902-5

TAKING everything into consideration, operations progressed as satisfactorily as could be expected. The unusual conditions and unique nature of the work made it necessary for us to evolve, rather than to suddenly start out on some mature plan of development. We had to feel our way, so to say, not only owing to the novel nature of the undertaking, but also to the question of finance. Regarding the latter aspect, however, it now became apparent that the increased shipments were materially improving the state of the Company's bank account; in fact, the tide which had been steadily receding for so many years had turned; our ships were sailing home in more senses than one.

This naturally improved the position as regards getting new plant, tramline material and rolling stock, and developments of a more permanent nature became increasingly in evidence. The building material with which the island was started would have broken the heart of any self-respecting engineer, but now one was engaged, principally to superintend railway construction and building operations. A two-foot gauge tramline connecting the two settle-

ments was put down and soon proved very useful. The little steam locomotives impressed the kanakas very much. At first they were somewhat scared of them, and cases were known where raw recruits at work in the phosphate fields, on seeing the engine coming full steam in their direction, had dropped their tools and made for the bush. This fear soon passed away and they would go to the other extreme, hanging on to the locomotive in clusters while going at a fair speed, in a way that would send a station-master in civilization into a "blue fit." Their experiences with trucks were frequently dearly bought; the new hands would persist in putting a bare foot on the tramline, and then pulling the truck on it, thereby involving loosening a toe-nail. When sent to the doctor they would usually lift up the toe-nail and waggle it up and down by way of demonstrating precisely what the trouble was.

We had a great deal of rain in 1902, causing much difficulty in getting sufficient sun-dried phosphate, and this naturally turned attention to the possibility of using mechanical dryers to do the work. The question was carefully investigated, resulting in the purchase ultimately of several types of rotating dryers from different countries, but for some years the results obtained from these were only partially satisfactory. In this matter, as in so many others, the position had to evolve.

These various developments naturally necessitated increasing the white staff at both settlements. Some had their wives and families with them and the question of medical attention had to be considered. Later

on a doctor was engaged and buildings in connection with his department were erected as opportunity offered. Housing accommodation of a more comfortable type for both the white staff and the kanakas was put up, and so the pioneering stage gradually passed away.

The extension of operations also necessitated an increase of the labour force, and for the first few years sufficient "boys" were obtainable in the Gilbert and Ellice groups, though it became increasingly evident that other sources must be investigated. The kanakas were invaluable for shipping operations, but not so suitable for some of the land work, being naturally slap-dash in their methods, and sustained labour did not appeal to them. However, the Gilbertese in particular have suited our requirements very well, and the fact that they have been employed at Ocean Island ever since 1900 is a good testimony to both their fitness and their appreciation of the conditions at the island.

Many of them engaged for service more from the spirit of travel and adventure than from actual necessity; others found that their earnings and the island trade store afforded excellent opportunities for buying necessities for their start in life when returning home, such as timber for canoes, light canvas for canoe sails, and sewing machines. Some of their requests for material were strange; one asked for a dental plate to be ordered from Sydney for him. On being told that such things were difficult and required a lot of fitting, he was not at all dismayed. "Bring it up," he said in his own language, "the

kamta [carpenter] will fit it in." They had profound respect for the ability of the carpenters and placed them on a higher plane than the other mechanics. The position of carpenter's mate was always much sought after, and it seemed as if their idea of bliss was to sit on a piece of timber and watch the carpenter working at it.

Visitors going to the islands were always impressed by the free and independent bearing of the natives from both groups. Evidently Mrs R. L. Stevenson also held this view; in *The Cruise of the "Janet Nichol"* she says: "None of the islanders we have yet seen on this cruise can compare with the Kingsmill people (Gilbertese) in haughty grace and carriage, nor are they in any way so fine a race physically." Such a failing as being on the lookout for baksheesh was quite unknown among them.

The Gilbertese have some rather quaint conceits about their own capacity. While admiring the skill of the white men in making things, they say: "So he ought, look at the wonderful material he has to work with. If we had it, we would do better." And when one sees what they do with their scanty material, the produce of two trees, the coco-nut and the pandanus practically providing for all their wants, it is easy to realize there is something in their point of view. Then too they trace the source of the white man's skill to an early tradition in the Northern Gilberts. There were two brothers, both high chiefs; the elder had the more power, but the younger was a very clever, skilful man, and could do all sorts of things. They fell out over some dusky damsel, a fruitful

cause of trouble, and the younger was obliged to put to sea in his canoe. He evidently reached a distant land, where he was well received, and he imparted to the people there the wonderful skill he was possessed of. When the white men first came on the scene with their large ships and clever ways, the Gilbertese said: "Here are the people whom the lost chief taught." And so we see how the present state of affairs has all come about!

It may be asked how was law and order maintained now that there were several hundred kanakas in the employ? As island manager I had certain powers in this respect, and acting on the recommendation of Mr Murdoch in 1900, also with the knowledge of the Resident Commissioner, I had appointed two Ellice Islanders as policemen, gradually increasing the number as the labour force grew. A small calaboose was erected in order to constitute durance vile, and these measures proved quite effective, without being at all resented by the kanakas. They certainly transgressed at times, though not to any serious degree, and when it became necessary to punish them, they "took their gruel" with a good grace.

A Gilbert Islander was had up once for attempting to create a disturbance, and after the somewhat serious nature of the offence had been explained to him, he was given three days in the calaboose with punishment labour during the day. He was heard to say something in an undertone at this, and I inquired of the interpreter as to the nature of his remarks. "He was saying," was the reply, "that he

had got off easily and ought to have had two weeks." On another occasion a kanaka had just finished some punishment work, when he saw me adjusting some coral slabs near the house, one of them proving beyond my strength. He quietly came across, placed it in position, and went on his way without saying a word, leaving me reflecting on the subject of coals of fire! Obviously the point of view of the Gilbert Islander differs from that of the white man.

These natives are particularly sensitive to ridicule, and frequently when a man had misbehaved, it was quite sufficient to tell him that such conduct would result in the women laughing at him when he returned to his island. The mere suggestion of such a reception would make him most uncomfortable, and would put him on his good behaviour.

About this time a sports meeting was held on New Year's Day, constituting the first event of that kind that the kanakas had seen, and the way they reacted to some of the competitions was somewhat strange. It soon became apparent that they had no idea of sport as the white man views it. For instance, they told the interpreter that the foot races were not at all the right thing; if one of the runners found he was faster than the others, he should ease up, so that they could all come in together, and not be put to shame in the presence of their womenfolk.

The tug-of-war contests between the different islanders proved too serious, and looked like ending up in a free fight. Shortly afterwards Rugby football was introduced by some of the staff on one of their half-holidays, and the kanakas played with

great keenness, but when the game was over they all went up to the white men and wanted to know how much overtime they were going to be paid for the half-day's work. However, by degrees they took to some of the new games, particularly cricket, and being athletic, they soon became quite good at it.

From these various incidents, trifling though some of them may appear, it will be seen that the natives have their own point of view about things, and sometimes there is a good deal of common sense in it. He who in any capacity would be successful in handling these interesting people, with their original lines of thought, must take pains to find out just how they view the questions which may arise, and should be prepared to make allowances accordingly. For instance, to expect them to cheerfully spring to attention and give up many of their old customs which are usually very dear to them, is asking too much. Moreover, they do not understand being hurried in such matters, for time is not so great an object with them as with us; it is much better for changes to evolve rather than to be brought in suddenly. In this connection too there is something in the old sailor's advice to his son: "Remember my boy, a spoonful of molasses often goes a lot further than a barrel of vinegar." Working on these lines one finds that few people are more responsive than these independent and high-spirited natives.

An outstanding event took place on 12 August 1905 when the High Commissioner of the Western Pacific, Sir Everard im Thurn, arrived in H.M.S.

Torch, with Mr W. Telfer Campbell, the Resident Commissioner. His Excellency had been visiting some of the other islands in the Gilbert and Ellice Protectorate, those groups together with the Solomons, Tonga, and others being under his jurisdiction. He came ashore, and was evidently much interested in the island, its important phosphate deposits, and the rapidly growing industry on such an isolated spot.

Mr Campbell remained on the island for some days in connection with official matters, it being included in the Gilbert and Ellice Protectorate for the purposes of administration. Formal inspections were made and various matters gone into both as regards the company and also the Banabans. An event of interest was the setting up of the first *kaubure*, to bring the island into line with the satisfactory system of local government existing on the other islands in the two groups. The *kaubure* consisted entirely of senior Banabans or *te unimane* (old men) and the term in general as applied to elderly people implies respect for their years of wisdom. The leader of the *kaubure* was Eri, the head chief of Ooma, a man of sterling character. He retained the position for a number of years with much credit. The Company of course had no authority over the *kaubure*, and the latter had nothing to do with our kanaka labourers.

Some time after the setting up of the *kaubure* one of its members died, and our Deputy Chairman, who was visiting us at the time, expressed the opinion that in order to impress the kanakas with the dignity

of the law, a cessation of work should take place for the day. This was done and shortly after, Mr Arundel asked our matter-of-fact half-caste interpreter, Ben Corrie, how the kanakas viewed the matter. He replied that they thought it was fine, but one of them, obviously the Gilbertese counterpart of a sordid soul, was heard to mutter something about it being a pity that a *kaubure* man did not die a little oftener.

In addition to the occasional visits of the Deputy Chairman during this period, we had several other welcome visitors at the islands, and the policy of personal visits from those who were associated with the business soon proved valuable, both as regards the first-hand knowledge they gained, and also from the constructive nature of their reports prepared for the information of the London Board. Early in 1905 Mr A. H. Gaze spent some time at the two islands getting a good insight into the conditions and the various developments. Two years previously his son, Mr A. Harold Gaze, who had joined the Sydney office in 1901, paid us a visit with a like beneficial result. At the time we little thought how closely his career would be associated with island management and developments later on. Several engineers, including Mr F. Danvers Power, visited both islands, to report and make recommendations for the Board's information. This procedure, though satisfactory at the time, was discontinued subsequently, the Company appointing technical men permanently on the island staffs.

Another change had taken place in the constitution

of the Company during this period, proving a very important development. In 1902 the Pacific Islands Company was wound up and the Pacific Phosphate Company came into being. The same personnel comprised the new concern, but the coco-nut islands and trading stations were disposed of, leaving us free to concentrate on phosphate operations.

A shipping disaster took place on 3 January 1904, the German steamer *Elba* going on the reef. She was lying at the moorings in Home Bay when a westerly squall suddenly came up, blowing hard onshore. For some reason the captain did not put to sea in time to avoid the obvious danger; a severe strain was put on the moorings and they parted. The vessel, being light, came right up on the reef and was holed in several places, though not seriously.

The event led to an incident which caused our staff intense amusement, and for quite a time afterwards "the three modern buccaneers" formed the main topic of conversation on the island. When the *Elba* came in on the reef, some of the seafaring members of the staff were sent aboard to render assistance in the hope of refloating the vessel. One of them, of the pronounced "sea lawyer" type, evidently formulated a scheme, and started reports among the Germans that she would probably slip off the reef that night at high tide and sink immediately, with much danger to the lives of all on board. This caused some consternation, resulting in all hands coming ashore in the evening, two sailors being left near the vessel to keep watch. It was intended to resume refloating operations in the

morning, and meanwhile the ship's company was accommodated in our settlement as well as possible.

Two or three hours later when it was low tide, the sailors on watch came up hurriedly to say that there was someone with a light moving about the vessel, and also two men were on the reef which was nearly dry, evidently endeavouring the plug up the holes. The ship's company rushed down, our Deputy Chairman, who was in charge of operations during my temporary absence from the island, going with them. The vessel was hailed, and the "sea lawyer" appeared at the gangway announcing in firm tones that she had been abandoned, and he had taken possession. The chief officer, evidently being a man of action rather than words, immediately drew a revolver and fired at him, a reception which naturally had a depressing effect. He came down the ladder protesting volubly and appealing to Mr Arundel for police protection, but without getting any sympathy in fact, quite the reverse. The Three Buccaneers left for Sydney by the first steamer.

Strenuous efforts were made to refloat the *Elba* for several days, the surf being comparatively light, and at high spring tide she came off, but taking in water so rapidly that they had to run her on the reef again to prevent sinking. She slewed right round, the fore part sinking and the stern coming high up in the air, almost overhanging one of our jetties. She remained like that for nearly two months, a tragic sight when I returned to the island. The surf meanwhile had been very low, but not long after, when aboard another vessel in the bay which was

doing some mooring work, we noticed that the *Elba* was grinding a good deal, the swell having suddenly increased. All at once the cry was raised, "*Noria te kaibuke*" (look at the steamer), and there was the *Elba* making her final plunge, going where all vessels which have the misfortune to get badly holed on a coral reef should go, to Davy Jones's locker.

Apparently after sinking she rolled over and over down the mountain which constitutes the base of Ocean Island, breaking up in the operation, her course being marked by pieces of wreckage shooting high up into the air, owing to the great depth from which they had come. One can give rein to one's imagination when contemplating such an extraordinary occurrence as a great steamer rolling down a submerged mountain, and picture Father Neptune, holding court down in the ocean depths, being interrupted by the unprecedented event. We were immensely relieved at having the *Elba* out of sight, and the menace to the safety of the jetty removed.

A feature which interested the Banabans quite a lot in connection with the *Elba* was the arrival on the island of a young bullock, saved from the wreck. Not having seen any quadruped larger than a dog, they were much impressed by the animal. Men, women and children from all parts of the island gathered at our settlement, sat round in a circle and watched it for hours. Not long after, a monkey was brought ashore from one of the vessels, and it proved an even greater attraction, the crowd vigorously exhibiting the same amusement and delight that is

always shown by small boys in front of a monkey house. The natives dearly love anything in the way of a joke, and about that time I frequently found that an effective one when meeting a Banaban mother with her baby, was the inquiry, "*Am banke maruru n te bon aei?*" (Is your monkey well to-day?) This always brought forth hearty laughter, a reaction rather different from what might be expected from their white sisters if a similar inquiry were couched in such terms.

By the beginning of 1905 the Company's European employees on Ocean Island numbered 50 and the kanaka labour force 900, which was about 200 more than the Gilbert and Ellice groups could be counted on for supplying regularly. A trial lot of a few Japanese had also been engaged as assistants, mechanics, cooks, and stewards, and this experiment, proving successful, promised well for future requirements. Certain changes were made in the management about this time, Captain Theet being appointed harbour master in charge of the shipping and mooring department for both settlements, with Mr G. W. W. Cozens as his assistant, my brother George being transferred to Tapiwa as manager there.

During this period, our output of phosphate steadily increased, the annual shipments being:

1902	22,460 tons
1903	57,253 tons
1904	77,420 tons
1905	107,950 tons

The demand much exceeded our capacity to supply, and emphasized the necessity for pushing ahead with plant developments. A material sign of progress in shipping and mooring arrangements was the increase in the size of steamers. In 1905 the s.s. *Dongola* loaded a cargo of 6500 tons, the largest one in 1902 being a 3800-ton vessel.

The question may be asked, how did the white staff fare in the matter of recreation on such an isolated spot? Quite a lot was done in that line. There was a recreation room at each settlement, with a billiard-table, piano and pianola, library, and newspaper files. A musical and dramatic society was started and a surprising amount of talent soon became in evidence. Visitors from civilization were frequently amazed at the excellent shows put on from time to time. An increasing proportion of the staff had their wives and small families with them, and as a general rule the women took to the island life very well. As regards outdoor sports, excellent concrete tennis courts were provided, and cricket and sea-bathing continued to be very popular.

The kanakas' recreation in the evening invariably took the form of the *ruoia*. Their sonorous chanting with hand-clapping accompaniment would always be heard right up to the police signal for "lights out." Periodically they would get a craze for kite-flying and would construct remarkably efficient ones with an eight-foot spread, resembling the man-of-war hawk. At such times our timber stocks would be surreptitiously raided, to supply the material for the frames, but police vigilance usually relaxed on

such occasions. Regarding their make of kite, I once saw one break away with a long length of line which kept it head on to the wind, and when last seen disappearing on the horizon, it was still flying bravely.

Between 1900 and 1906 we paid several visits to Nauru of a preparatory nature prior to the actual starting of phosphate operations. In May 1901 I accompanied Mr Arundel, the Deputy Chairman, with Herr Brandeis, the *Landeshauptmann*, or District Governor of the Caroline and Marshall Islands, and also two officials of the German company, to the island when a meeting of the chiefs representing each tribe was held, in order to acquaint them with the recent developments. They were told it had been found that the rocks and soil on the high portion of the island were useful to the white men, and that the company whom we represented would pay them for the phosphate at a stated rate. The chiefs were gravely interested; one of them thought it was hardly the thing for the white men to have to pay for rocks, and another suggested that when they were being removed, we might leave behind sufficient for them to make the special stone sinkers they use for their fishing-lines. He must have had some prophetic insight into the white man's thoroughness.

After the meeting, the Europeans present walked a long distance through the phosphate country, some of us younger men wondering who would crack up first, the Deputy Chairman or the *Landeshauptmann*, but though perspiring profusely, both

kept on with the doggedness of their respective races, doubtless each wishing that the other would give in. It was left for one of the younger members of the party to tactfully suggest it might be advisable to turn back.

Shortly after, Mr F. Danvers Power, assisted by our chemist, Mr A. E. Stephen, made a preliminary survey of Nauru, an interesting work I was glad to take part in, and thus see a good deal of the deposits on this wonderful island. A number of shafts were sunk, numerous measurements taken and samples of phosphate brought away, in order to enable Mr Danvers Power to send in an independent report for the information of the London Board and others interested financially. As the result of these investigations he arrived at the estimate of 42,000,000 tons of phosphate which he stated was proved by the amount of prospecting done, though there was no reason to think that there might not be more than double that quantity.

On a later visit to the island I went into the question of locality for establishing our settlement when the working of the phosphate should be commenced. It was evident that the district known as Yangor was the best, for besides being in a good position for shipping operations there were but few native homes in that vicinity. I was informed that the reason for this latter condition was on account of that area having constituted a sort of battlefield between two of the main villages, a good deal of sniping being done there. A further recommendation made was that while the office, stores, workshops

and labourers' quarters should be located on the coastal belt, those of the staff connected with shipping operations should be practically the only ones to live in that vicinity, the rest of the staff houses and the hospitals being on the high ground at the back of Yangor. Through force of circumstances, however, the latter proposal was not adopted, though developments of recent years have been largely on those lines.

CHAPTER XIII

NAURU TO THE RESCUE, 1906-7

No! Ocean Island had not collapsed; quite the contrary; we were going strong. The trouble, if it can be called trouble, was that the superphosphate manufacturers found the new class of phosphate so useful for their purposes, both as regards suitability for manufacture, and high quality from the farmers' point of view, that we were fairly snowed under with orders. Like Oliver Twist they were continually "asking for more," and at times in quite a clamant way.

Ocean Island could perhaps have satisfied demands for two or three years longer had the weather been always fine, but therein lay the difficulty. Steamers were sent along in increasing numbers, but sometimes when weather conditions were against us, there would be a daily parade of four or five large vessels in front of the settlement, with signals flying "When will the weather moderate?" or phrases to that effect. Such congestion of tonnage naturally was not conducive to obtaining the low freight so necessary in the phosphate trade. It became increasingly evident that the time had arrived for starting operations at Nauru, and preparations were made accordingly.

Ocean Island is the mother of Nauru from the

phosphate point of view, and if the daughter has surpassed the mother, does not the same thing frequently happen in real life? In the race for supremacy, however, it was a good many years before Nauru caught up; Ocean Island did not take it lying down. Besides having many natural advantages, the daughter started with a silver spoon in her mouth; the financial tribulations of 1900 did not exist in 1906.

A competent engineer, Mr W. Schonian, was engaged to visit Nauru and formulate plans for working the island. He first came to Ocean Island, saw what our arrangements were, of course improving on them in some ways, and so in this way, as in others, the results of our hard-earned experience proved valuable. Arrangements were made for a German firm of contractors to erect the numerous buildings at the settlement, including staff houses, labourers' quarters, and phosphate bins. This naturally facilitated matters very much. It was decided to build the settlement at Yangor as previously mentioned, and to run out a wooden jetty of the same type as at Ocean Island.

A German manager was engaged, his staff being partly British and partly German. The British predominated and included experienced men from Ocean Island. A number of Chinese labourers were brought direct from China, and later on a good large gang of Caroline Island kanakas was engaged from that group. A start was made on 3 June 1906, when the manager, Mr Larsen, arrived on the island, some of his staff following on the 6th, when Cap-

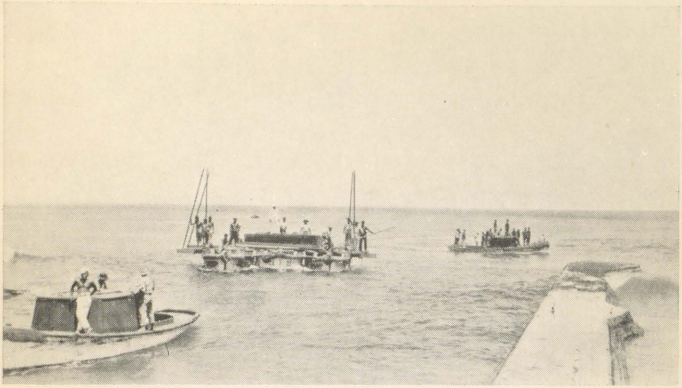


Photo: C. N. Hayward

BRINGING HEAVY MACHINERY ASHORE AT NAURU

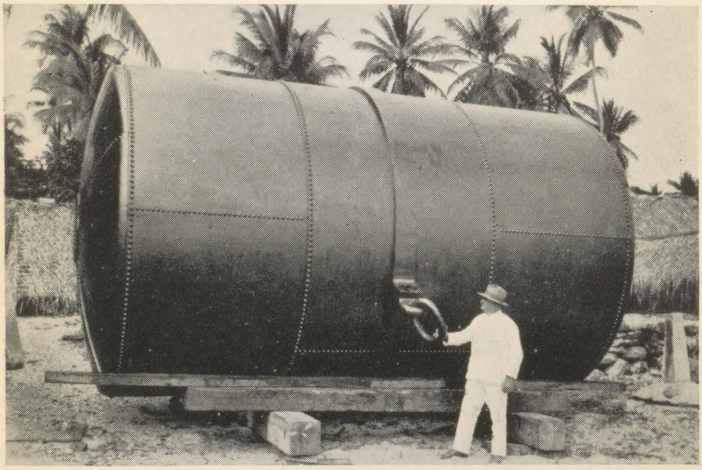


Photo: J. A. Bissett

ONE OF THE BIG MOORING BUOYS

tain Theet with his assistants in the marine department also arrived from Ocean Island in the s.s. *Inger*, for the purpose of laying the moorings, which work was successfully carried out a few days later.

Every assistance was rendered by the German district officer, and sufficiently large areas of land, both for settlement purposes and for phosphate working, were immediately available. No direct negotiations with the Nauruans were necessary, as far as the Company's manager was concerned. So leaving them there to make a start, we will return to current events on Ocean Island.

Another shipping disaster unfortunately has to be chronicled. It happened before daylight on 20 November 1906, when the Norwegian steamer *Inger*, then loading in Home Bay, came in on the reef owing to the moorings parting during a heavy westerly squall. Ordinarily the vessel would not have been at the buoy in such weather, but the captain considered that the squall would not be heavy, and of course errors of judgment will take place so long as ships go to sea. At daylight our men were speedily off to render assistance. The weather had calmed down, but during the day the surf increased, and the vessel bumping heavily was soon badly holed. In the early morning when I was aboard, the iron deck was working up and down like the waves of the sea, as she came down on the reef, and the funnel seemed as if it would jump out of its socket. Nothing could be done, and in the evening the captain, who was badly broken up, was prevailed upon to come ashore. The vessel

sank the following evening and went well out of sight, if not out of mind.

In view of this disaster, and the previous one to the *Elba*, it will be realized that the moorings constitute a vital part of our operations. Any one not acquainted with the island conditions might ask, why do not the vessels just steam in to position and drop their anchors like they do elsewhere? Unfortunately the reason is only too plain to seafaring men, for a captain's first thought before anchoring is, what are the soundings? A ship's cables, even if paid out to full length, would not keep a vessel from coming in on the reef, and in any case the ordinary ship's windlass is not capable of lifting the anchor with such a weight of chain.

The difficulty is overcome by putting down a set of deep-sea moorings, the deepest in the world. The outer anchor is dropped in 200 fathoms (1200 ft) of water. Attached to the five-ton anchor is a certain length of three-inch (diameter) chain, then a length of eight-inch (circumference) special steel wire hawser, then a short length of chain which is shackled to the main buoy. This particular buoy is necessarily of very large size in order to carry the great weight of chain and wire hawser, and is probably the largest made anywhere. It is 21 by 12 feet, cylindrical in shape, and built with four watertight compartments. The "up and down" moorings is thus constituted, and its purpose is to keep the vessel from coming in on the reef. In order to prevent this vertical portion from being dragged out to sea, two offshore steel hawsers of six-inch circumference are run

out at an angle from the shore reef and shackled on just below the main buoy. When the moorings are laid, the buoy is thus at the apex of a triangle, of which the shore reef is the base, and the off-shore hawsers are the two sides. The vertical portion of course extends seaward to some extent, from the apex of the triangle. The main buoy thus moored does not have much range and ordinarily the vessel lies well, but in view of the great depth, it is necessary for her to cast off and put to sea if the wind blows on shore with greater force than a light breeze. The bridle, which is a short length of chain leading up from the moorings and taken aboard the vessel, is so arranged that she can let go at a moment's notice, and as her fires are kept banked, a minimum of delay is incurred in putting to sea. She can of course lie at the moorings safely if the wind is blowing either off shore or along the shore.

The foregoing is briefly the arrangement of the moorings. Naturally there are many special features which have been perfected by long and sometimes painful experience. For instance, our first buoys were not specially protected. A vessel collided with one and sent a moorings costing £5000 to the bottom of the deep blue sea, and of course the captain held that he was not to blame. The next buoy was very much protected, and when bumped against, a hole was made in the vessel's bow, a mishap which annoyed that captain excessively. Finally a massive wooden fender was designed which protects the buoy without damaging the vessel, though it is not a thing

to be trifled with. On one occasion I had boarded a vessel which had just arrived, and when steaming up to the buoy the captain came in with too much way on. She shot ahead of the buoy, getting too near the reef and the propeller was kept going a shade too long. It gave two thumps on the buoy fender, one blade disappeared and another was damaged: things were "only middling" on the bridge.

The work of laying these moorings was very difficult and expensive. The vessel used for the purpose had to be fitted with massive baulks of timber for'ard, the anchor, chain, and wire being paid out over these a few feet at a time, making the vessel shake from stem to stern. The usual procedure was for the steamer to put to sea, while the operation of lowering about 175 fathoms of the vertical portion was going on. She would drift that night with this 1050 feet of material hanging from her bow, and would then steam in next morning on a bearings until the anchor took the bottom. About 25 fathoms of "up and down" would be paid out, and lines would be run quickly from the shore reef to keep her in position while the off-shore hawsers were being connected up, thus completing the work.

The moorings for our lighters or surf-boats were laid in a line close inshore, there being usually accommodation for about fourteen boats, but in the event of heavy surf or westerly weather coming up, they had to be taken ashore hurriedly, otherwise we ran the risk of losing them. Such accidents happened

from time to time, and the safety of these lighters constituted one of the problems. Each boat was manned with a crew of five, four of them pulling and the boat captain at the steer oar, which was always used, as the ordinary rudder was of no service in the surf. The surf-boats were especially built for our conditions and were particularly strong and seaworthy. They had hard usage and several men were continually employed repairing them.

During this period developments at Ocean Island had been progressing steadily, a very important one being in connection with loading operations. When Mr Gaze, Senr, first visited the island early in 1905, he had reported to the London Board regarding the existing method of shipping, and his remarks may be quoted as being the views of one coming fresh to the scene:

> I have watched the operations frequently at both the jetties at Ooma, and once at Tapiwa. . . . The way in which the men manage to hold the boats in position when they are not only rising and falling on the breakers at least ten feet, but at the same time being washed in towards the outer piles and then drawn away by the receding waves, is wonderful, but the work is risky, and to keep the boats sufficiently steady for the phosphate to run from the shoot into the baskets instead of over the sides into the water requires the greatest vigilance on the part of the wharfingers, and no little skill on that of the boatmen to avoid being knocked over and damaged by the shoot.

As a matter of fact, on several occasions boats were swept against the outer piles, and were reduced to firewood in less time than one can write it. When the crew saw that such an accident was inevitable,

they would all jump overboard and dive underneath the approaching breaker.

These difficult conditions were caused by the wooden jetties not projecting far enough beyond the edge of the reef where the surf broke heavily. Plans were agreed to for replacing them with steel structures having a considerably longer projection, and in due course two steel jetties in the bay and one at Tapiwa were installed. These proved a great success, and the surf-boats were able to load in smoother water beyond the line of breakers. The structures were also more stable in the event of very heavy surf, which was always a menace to the safety of the wooden jetties. The latter were never actually carried away at Ocean Island, though they were badly damaged on several occasions. At Baker Island some years previously I saw our jetty, 100 yards in length, swept away in less than half a minute, just as if it had been built of matches.

Important improvements were also made in connection with the artificial drying of the phosphate. The first three rotating dryers to be installed had fallen short of expectations, but eventually two, of a different type made in France, were sent out and they proved a great success. It was a big move forward to find that phosphate drying could be carried on economically day and night irrespective of the weather, though our arrangements in that department were still comparatively primitive, and we had to do a great deal of sun-drying of the phosphate as well.

The increasing white and kanaka population had emphasized the necessity of modern arrangements in regard to sewerage, and during this period a modern system was installed throughout both Ooma and Tapiwa settlements. Owing to the rocky formation a good deal of blasting and difficult stonework was necessary in carrying out this development. A powerful pumping plant was installed for delivering sea water to large cisterns near the top of the island for flushing purposes. This work, though expensive at the time, has been a very important factor in connection with the health of the community.

With regard to the supply of fresh water, a simple form of condenser had been installed on the island at an early date, and so the Banabans had the surprising experience of seeing the sea water turned into fresh. They and also the kanakas quite acknowledged that it was good, but they always spoke of it as *te taari* or sea water, while the fresh article was *te ran*. Their point of view was that as the former was made from sea water, it should be called by that name. As an instance of the unusual conditions at Ocean Island, I may mention that on one occasion a large pump feeding the condenser boilers ceased to function in a strange manner, and on opening it up, the engineer found that a young octopus had been drawn up the suction pipe from the reef, and its tentacles were entangled through the pump mechanism in a remarkable way, the creature being still alive. These primitive condensers were very expensive in fuel consumption, and they were superseded about this time by a modern plant which

proved very successful. As opportunity offered, many large concrete cisterns were built and connected up with the roofs of the various buildings for catching rain water.

During this period, important changes were made in the administration arrangements, the Resident Commissioner's headquarters being transferred from Tarawa in the Gilbert Group, to Ocean Island. He would thus be more in touch with outside communication, and another factor having a bearing on the matter was the increasing commercial importance of our operations. Mr W. Telfer Campbell had paid several official visits to the island during 1906 and 1907, and on one of these a site for the Residency was selected near the centre of the tableland. We erected the building for the administration and Mr Campbell made it his headquarters at the beginning of 1908. We still continued to police our section of the community, as he was making occasional visits to the Gilbert Group, and the official organization took some time to set up.

A change was also made in connection with our Australian office which was transferred from Sydney to Melbourne, to be in closer touch with the headquarters of the large fertilizer companies who were purchasers of the phosphate. In June 1906 Mr A. H. Gaze, Senr, the Chief Representative, with the members of his staff moved to Melbourne.

In July 1907 we had evidence of the Company's activities in the way of phosphate prospecting by the arrival of the s.s. *Tyrian* with the Deputy Chairman, Mr Arundel, my father Mr G. C. Ellis,

and brother Mr J. M. Ellis, aboard. A number of islands were examined during the voyage, principally in the Eastern Pacific, and important deposits of high-grade phosphate were located on the French island of Makatea, though it appeared that several Frenchmen from Tahiti suspected the existence of such deposits, and were on the island when the *Tyrian* arrived. Certain important negotiations were entered into subsequently in London and Paris and a French company, Compagnie Française des Phosphates de l'Océanie, was formed to work these deposits, the Pacific Phosphate Company taking a large financial interest in the concern, also assisting the undertaking in its earlier stages. Two of the French directors, one of whom was a civil engineer, visited Ocean Island and Nauru in June 1910 in order to see what the methods were, so again the experiences gained over a number of strenuous years proved useful to another island. It was arranged that when Makatea was far enough ahead for shipping operations, our marine superintendent, Mr G. W. W. Cozens, should go there and lay the first set of moorings.

What of the Banabans during these years of strenuous development? They had seen so many wonderful happenings that they had reached the stage of not being really surprised at anything. Their manner of living naturally changed under the new conditions. Working for the Company was popular with the younger men, many of whom became quite useful to us, and were put on at the better jobs. What with their earnings, and payments made by the Company in respect of phosphate from their lands,

and leases, they became a well-to-do native community. It was not unusual for a canoe crew to bring in fish for sale at the store to the value of £1 or more as the result of their morning's catch. Scarcity of drinking-water hardly existed, as many of them built cisterns, or purchased tanks; in the event of a prolonged drought we supplied condensed water at a nominal price. Under these conditions, also with free medical attention, their strenuous life of olden times had passed away.

Returning to Nauru, how were things going there? Not too well at first, and it appears that there is no royal road when starting operations on phosphate islands, for each place seems to have its special problems. The principal difficulty at Nauru was, however, of an artificial nature: there was friction between the manager and the other Germans on his staff, also the German employees of the contractor erecting the buildings. The British section was not disaffected. The progress of the work was naturally hindered, and loading operations could not be commenced at the time anticipated.

The Deputy Chairman and the Chief Representative were much concerned at the position, and the former was discussing it with me at Ocean Island when I made the suggestion that they might try Captain Theet for the position of manager. A proposal to that effect was placed before the London Board and was approved, the Chief Representative pluckily undertaking the unpleasant task of making the change. Mr Gaze remained on Nauru for several months and straightened things out, while

Captain Theet settled down in his new position. The change of manager proved to be the solution of the difficulty; the Captain became very popular with the Germans and was quite master of the situation.

Things soon took a definite turn for the better, and loading was started on 27 June 1907, the s.s. *Fido* leaving on 6 July with 1917 tons of phosphate, but she was unfortunately wrecked on the New South Wales coast. History rather repeated itself; at Ocean Island the first truckload of phosphate came to grief, and at Nauru where things are always done on a larger scale, the first shipload was lost, both events demonstrating the truth of the saying about a bad beginning making a good ending.

Shipments of phosphate during these two years were:

	Ocean Island	Nauru
1906	141,550 tons	—
1907	179,100 „	11,630 tons

The "daughter" was beginning to lend a useful hand, and better things were to follow.

Our record day's work at shipping up to the end of 1906 was 948 tons, working nine hours with sixteen boats.

CHAPTER XIV

"FULL SPEED AHEAD," 1908-13

FORTUNATELY we had fine weather in 1908. A very big shipping programme was mapped out for us, but we managed to get through and shipped just on 210,000 tons; figures which were not exceeded until 1921-2 at Nauru, and 1926-7 at Ocean Island. A kindly comment regarding those early shipping experiences was made later on by one of our island engineer-managers who said that he did not know how such work was done, seeing that there were no launches for towing the surf-boats, nor other labour-saving devices which were introduced in after years. In those days of oar-work we certainly turned out a lot of magnificent boatmen, and when they were out to put up a record, or when anything unusual was on, their performances were remarkable.

One morning Captain Roberson, who had been promoted to the position of harbour master when Captain Theet was transferred to Nauru, came to me in considerable concern. The surf had suddenly risen and was rapidly getting worse, the tide was falling, the wind was in from the west and soon the bay would be "like a boiling pot" as the sailors say. We had twelve surf-boats out at their moor-

ings, and they had to be brought ashore, otherwise some at least would be lost. Departure from the usual orders was advisable, and an inspiration came to me. "Tell them that each man who goes out will get two pounds of tobacco." Word was soon passed round, and the sporty nature of it appealed to the kanakas. They were quick at sizing up a position, and they saw what was in our minds. They would show the white men what they could do. But the situation required noise and as their superfluous clothing was cast off and loin cloths rapidly adjusted, they started yelling, the Ellice boys first, and that set the Gilbertese off. A crowd of Red Indians would have been speechless with envy. The sixty were off, diving under the breakers as they came pounding in on the reef, coming up again to breathe and to yell, and then under again. Soon they were beyond the last line of breakers, and all clambering into their respective boats, getting ready for the big job. One by one they came in through the surf, most of them without mishap, but some were swamped and men from the beach were soon out to their help, dragging the boat in sufficiently to get the ropes on and the bailing-out done. Not a single boat was damaged, and their crews, collecting their clothes, filed off with well-pleased looks to the store for their tobacco.

One day a trading steamer called at the island when there happened to be a big surf running. Two passengers came ashore, Americans connected with the phosphate industry, who were travelling round the world visiting the various deposits. In their

typical manner they gave a graphic account of their sensations when coming through the surf. "I made up my mind what to do if anything happened to that boat; I was just going to jump right on to that big buck-nigger who was steering, and hang on to him until we got ashore." "Look here," I said, "in the first place don't call them niggers, they don't like it; they are hot-tempered and they are powerful men." He looked thoughtful and said he would not call them niggers again. "If anything had happened," I went on to say, "and if you had been capsized and thought it was a good opportunity to commit suicide, you wouldn't have had any chance at all. They would have yanked (sorry, not intentional) you out whether you wanted it or not." He thought that was fine, and we went off to look at the phosphate workings.

It may be asked what ought a European to do when going through a heavy surf? The best plan is to hang on to the seat to avoid being thrown out if things get lively, and say nothing, even if feeling decidedly scared. The natives know best what to do, and if anything happens, their first thought will be for the helpless white man. Of course the greatest danger is that the boat will capsize on top of someone, either trapping him underneath, or pounding him against the reef, and for that reason a native canoe being much smaller and lighter, has some advantages, though one gets a maximum number of thrills in it.

To help with our shipping and recruiting operations, a serviceable motor-launch was obtained in

1908, and named *Joan* after the first white baby girl to arrive on the island. It proved such a success that others were obtained subsequently, and before the end of this period, launches were being used for towing all the surf-boats. The type of launch we found most suitable was of very seaworthy build, and the semi-Diesel engines used in them stood up to the rough work very well. The kanakas soon became proficient at handling them.

This innovation accentuated the need for a boat harbour, or at least a deep-water channel through the reef, permitting of hauling up the launches at any state of the tide. At Nauru an excellent boat harbour was constructed by blasting out a considerable basin, and enclosing it with a sea-wall, leaving a narrow entrance. Under normal reef conditions this boat harbour serves its purpose very well, but the entrance to it is dangerous during a heavy surf. At Ocean Island a passage was blasted through the reef, and a basin made, but walls were not erected at that time. By means of these arrangements a great deal of the difficulty regarding the safety of the surf-boats was avoided.

The kanaka labour force had been further increased during this period, and it became very evident that we were exceeding the resources of the Gilbert and Ellice groups as a recruiting field. We therefore decided to put into effect a long-standing proposal to use Japanese labourers for phosphate work, as we had employed them on the Queensland coast islands, prior to the starting of Ocean Island, with very satisfactory results. When the kanakas

heard that the Japanese were coming for this purpose, they were quite amused and said in effect, "just wait until they are working at the phosphate and you will see them topple over," referring to the heat of course.

On 3 February 1908, a force of 145 labourers with some mechanics and cooks arrived by one of the Japanese steamers, and they speedily settled down to their work. Their methods and energy at the phosphate operations were of course much ahead of the kanakas, who watched them with blank amazement. The labourers were partly from the mainland of Japan and partly from the Liu-kiu Islands to the south; both were a good class of labourers, though the former eventually proved the better. Mr Watanabe, the inspector approved by their Government, was in charge of the Japanese. He was a middle-aged man, quite a disciplinarian, and certainly very suitable for the position. When he spoke they sprang to attention. I was told afterwards that in his early days he had become mixed up in some wild doings and was a member of "The Band of Drawn Swords." Perhaps it was then that he learned how to handle men, and we had no trouble during his regime. One of the conditions of employing Japanese abroad was that a medical man should accompany them, and in this selection also we were fortunate. Dr Matsuoka was both capable and courteous to a degree, he and his wife becoming highly esteemed by our white staff. Unfortunately he contracted a bad type of fever when out on a labour-recruiting trip in the Carolines in 1916 and

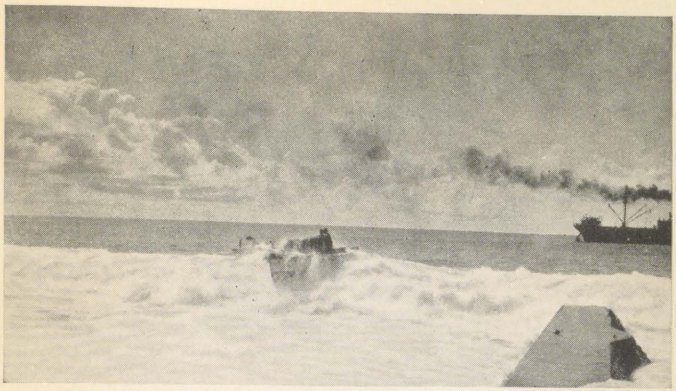


Photo: C. N. Hayward

LAUNCH ENTERING NAURU BOAT CHANNEL IN HEAVY SURF

Photo: C. N. Hayward

NAURU BOAT HARBOUR IN ROUGH WEATHER

died at Nauru. His untimely decease was mourned as sincerely by our white population as by his own countrymen.

About this time a Japanese labour agent through whom we had engaged the men, visited the island to see what the conditions and prospects were. His acumen and knowledge of the business impressed me very forcibly. On one occasion I was stressing the importance of sending country Japanese and not town men for our requirements. "Yes, yes, I know," he said, without a moment's hesitation, "the rogues in the country go to the towns." By a sort of automatic elimination process, the country people were the better characters.

During 1908 the white staff was increased to about seventy at each island and our labour force reached its maximum at Ocean Island when we had just over 1000 kanakas, together with nearly 400 Japanese coolies and mechanics. It may be asked how all these people were fed? The Japanese were supplied with a variety of provisions from their own country, together with tinned meat and fresh fish when available. The kanakas' rations consisted of fresh fish, tinned beef or *bullamacow* (bull and cow) as it is generally called throughout the Pacific, tinned fresh herrings, rice, biscuits, tea, and sugar. The fresh fish is of course an uncertain quantity, depending largely on the weather, and the season when different kinds of fish come to the locality of the islands.

For some years we used to send out several canoes daily to catch fish, with varying success. Frequently they would bring in sharks, but a deputation of kana-

kas came up once to ask that no more sharks be given to them, and as was usually the case on such occasions, they advanced some original reasons for their request. "Why," I said, "on your own islands you are only too glad to get shark." "Yes," one of them replied, "that is true, but eating shark makes us very sleepy. On our islands we could lie down on our mats and have a good sleep, but here the bell goes and we have to turn out and work." "Besides," said another, "on our islands we don't work for the white man. When we do we expect to get the white man's food." In view of these good arguments, shark was cut out of their menu forthwith.

The numerous sharks in these waters did not necessarily constitute a serious element of danger to the natives and to our kanaka boatmen. In ordinary circumstances they had no fear of them whatever, but if when out fishing their canoe or boat should get swamped, there was danger then, as the sharks would be attracted by the fish or the bait, and with their appetites whetted, they would be liable to attack the men.

These people know much more about sharks than we do, one of the things being that their bump of curiosity is more highly developed than that of caution. So when a canoe was out shark fishing the Banabans would frequently tap the sides of the craft with the butts of their paddles, and a shark in the vicinity would probably come along to see what the big noise was about. One of our kanaka boatmen once displayed his skill when alongside a

steamer at the moorings. Observing sharks in the vicinity he held a rope noose in the water with one hand, and then snapped the fingers of his other hand under water repeatedly. The sharks were attracted and five in succession, ranging from three to five feet in length, swam into the noose and were pulled up. The native repeated the performance on another occasion, when a similar number of sharks was caught. The captain of the vessel witnessed the exploit, and to use the words of one of the staff who was present, "his eyes almost bulged out of his head with amazement."

But to return to the subject of the labourers' rations, it might be supposed that any kind of bully beef would do for the kanakas. This is very far from being the case, and the practice is to pack meat to quite a stringent specification for them. On one occasion they found that it was customary for the packers to include what we usually designate "lamb's fry," cut up fine, and mixed with the meat, but the kanakas made trouble about it. They think that the white man's practice of eating such things, also tongue, ox-cheek, or brains, is quite unorthodox. Even the trade-mark has to be studied, and it is said that the canners of a pack having the "Dragon" brand, had to discard that mythical monster, through the kanakas getting the idea that the contents must assuredly be tinned dragon, an animal they did not like the look of.

During the first few years, the kanakas had their meals in true native style, just squatting about on the ground adjacent to their quarters, and going

on the principle that "fingers were made before forks." The arrangement proved insanitary in view of the large number of men, and therefore a large mess-room was built at each settlement, fitted with long tables and forms, plates and mugs being provided. To our great surprise, they absolutely refused to use the mess-room, in fact struck work as a protest when the matter was pressed. The reason they gave the interpreter was that it was "*babaka te matan*," (aping the white man). They gave way eventually and soon realized the benefit of the arrangement.

An outbuilding in the hospital grounds was put to a novel use on one occasion, affording an instance of the kanaka's strange mentality and its effect on their health. A Gilbert Islander was seriously ill, and the doctor feared he could not recover, when to the doctor's surprise the patient said that if only the doctor would allow him to be shifted to the little house over there, pointing to the mortuary, he would get better. The doctor decided to humour him, though not feeling hopeful as to the result, and so the patient was transferred as desired. Shortly after, a definite improvement took place, and the patient made a good recovery.

About the middle of this period changes were made in the mission arrangements, the American Mission which had been the pioneer on both Ocean Island and Nauru, handing over the work on the former island to the London Missionary Society. Several years prior to this the Americans had shifted their central station at Kusaie to Ocean Island where

A CABLEWAY AT NAURU

the Rev. I. Channon remained in charge. The change now made proved a good arrangement for our kanakas, most of them being adherents of the London Missionary Society. In consequence of this event, the native teacher, Taremon, who had gained the respect of all during his long years of faithful service on Ocean Island, returned to his home at Tabiteuea in the Gilberts, his place being taken by an L. M. S. Samoan pastor. The native services were always conducted with decorum and reverence, and the sincerity of one and all was evident.

The latter feature may be illustrated by two incidents which came under my personal notice. On one occasion the Gilbertese from a southern island in the group came to the office and told me that they considered they should not take the rations of fish issued from the store on Monday mornings, because it had been caught by some of the Banabans on Sunday night. It would not have done to issue *bullamacow*, as some of the other labourers would have attributed their scruples to design, so afterwards on Mondays without any demur they drew rations of rice and biscuits only. Though the matter may be considered a small one, was it not the same motive that actuated the illustrious four captives whose record has come down to us through the centuries, as having elected to eat pulse and drink water, rather than the luxuries from the heathen king's table?

The same set of young fellows on another occasion had to turn out on a Sunday afternoon with the other boatmen to haul the surf-boats up, owing to

the surf having risen rapidly. They came up to me subsequently to say that while they knew it was right to do this work and save the Company's boats, they thought they should not take any overtime payment for Sunday work. Again the reply could only be given "*Are i roum*" (It rests with you).

In addition to the L. M. S. Mission, there is also a branch of the Roman Catholic Sacred Heart Mission on the island, a considerable number of our kanakas being adherents. The Father in charge has been on the island a long time, and is held in high regard by the little community.

Further improvements in the island plant were made during this period, one of the most important being the installation of Diesel engines for generating electricity at both islands. In a comparatively short time all the machinery was changed over with very beneficial results. Electric light was installed throughout the settlements, wide angle searchlights were introduced for shipping operations by night, proving particularly useful, and altogether it was a pronounced forward move. The kanakas called the electric power *te iti*, or the lightning, and the electrical engineer, Mr Joseph Clarke, who installed the plant at Ocean Island was *Te Mataniwin te iti* (chief of the lightning). They were somewhat incredulous about the deadliness of live wires at first, but the effect on a pair of pliers which were accidentally dropped and came in contact with the current, was a useful object lesson to them. The crude oil for the Diesel engines, which was sent up in large drums, and also the large quantities of coal used

for the dryers, took a great deal of time to discharge. It always seemed easier to ship 10 tons of phosphate than to land one ton of cargo. Heavy pieces of machinery and dryer cylinders were landed by lashing two or three surf-boats together and building a platform across them, of course choosing a calm day for such operations.

Modern refrigerating machinery was installed at each island, the ice proving a great boon to the white residents, also facilitating bringing up supplies of fresh meat, butter, fruit, and vegetables from down south when we were fortunate enough to get a vessel on charter which had refrigerated space aboard.

The ice surprised the kanakas a good deal, as they could not quite realize whether it was cold or hot. One of the most astonished was an elderly head chief from Nonouti, who had been helpful with our recruiting operations, and was therefore given a trip to the island to see the wonderful things the white men were doing. The interpreter, Corrie, took him round the settlement, and they came to the ice-plant where a Japanese was sawing a block of ice in half. Corrie told him it was water, but the old chief would not have it at all. "Whoever heard of cutting water with a saw?" was his apt comment. The interpreter watched his opportunity and slipped a piece of ice down the back of the old gentleman's neck. He gave a tremendous yell and exclaimed that something was burning him. They next came to the machine shop where he surveyed the maze of machines, belts,

shafts and pulleys in wonderment, and asked Corrie: "Where does it all begin?" The telephone proved the climax, for on being told to speak to a man whom he knew was on the other side of the island, he dropped the receiver on hearing his voice, and declared that it was *te anti* (ghost). His account of everything when rejoining his fellow *kaubure* men at Nonouti must have been graphic.

Another important development on Nauru in 1908 was the installation of cableways. At Ocean Island the first plant did not prove economical, mainly because a suitable site for it was not available at the time. An ingenious device to suit the local conditions was worked out by the Company's consulting engineers in Melbourne, Messrs J. M. and H. E. Coane, with the makers, Messrs J. M. Henderson and Co. Ltd, of Aberdeen, the two cableway towers being mounted on heavily ballasted carriages. The span between the towers was 660 feet, and along this length of wire rope a carrier traversed rapidly, lowering a 30-hundredweight skip to the phosphate deposit. This was filled by hand, then run along to a hopper, underneath which the rakes of trucks were loaded by gravity.

This method proved very suitable for working in between the ever present pinnacles, which were too numerous to permit of using the ordinary steam shovel. When the strip of ground underneath the overhead wires was worked out, the towers on their carriages were readily moved forward for the next strip. Quarrying phosphate in large quantities by this process was rendered possible by the increasing

mechanical drying plant, and by degrees the position was reached whereby all the phosphate was raised in its wet state, and run direct to the dryers.

At Ocean Island, quarrying operations were also very favourably affected by the improved drying arrangements, and as the wonderful tableland area was opened up, it became possible to work in on a face to an increasing extent, cleaning out between the pinnacles subsequently. For some years self-acting tramlines had been in use for transporting the phosphate from the tableland to the low level main line. This was unnecessary at Nauru where the tramlines could be extended on the right level for running the phosphate from the cableways to the next stage of operations.

The arrangement at Nauru in connection with crushing, drying and storing, was to dump the cars of wet phosphate on to a grizzly over the wet hopper, and from there the rock dropped into the gyratory crushers which reduced it to a maximum size of two inches. The wet phosphate was then taken by belt conveyors to the wet bin, built over the feed end of the dryers, automatic feeders regulating the flow of phosphate into the cylinders. The dryer cylinders were set in the direction of the slope of the ground, and the dry phosphate emerging from them dropped on a conveyor belt, which transported it to the adjacent storage bins. It was then ready for shipment. The slope of the ground at Nauru was just right for the foregoing gravity arrangements, and for building the storage bins on the flat coastal belt, where they were in suitable positions for running

the dry phosphate in trucks drawn by electric locomotives to the jetties for shipment. At Ocean Island the conditions at that time did not permit of such a smooth working arrangement, and elevators, which had to be used to a large extent, were frequently a source of trouble. It was soon realized at both islands that large storage bins were of vital importance to our operations.

It may be said that all the land arrangements were based on the necessity for facilitating quick shipping. We always recognized that not only did quick despatch conduce towards lower freights, but also the risk to the safety of the vessel was thereby minimized. The sooner a steamer was loaded and away, the sooner was the risk over; if a vessel was delayed unduly at the islands, the natural tendency was for vigilance aboard to relax somewhat, particularly in the matter of putting to sea when westerly conditions became too much in evidence. Right from the commencement of shipping operations, our exertions were bent on speeding up the rate of loading, and towards this end, putting up records was a most important factor. A friendly rivalry between the Ooma and Tapiwa shipping gangs was developed, with beneficial results, and when Nauru came into the picture a series of contests commenced which extended over a number of years, first one island and then the other breaking the record. When an attempt in this direction was being made, the whole settlement would get more or less excited as to the issue, and the degree of yelling on the part of the

boatmen was a good indication as to how things were going.

We never attempted to break records on Mondays, or even Tuesdays. The thought of the week's work ahead of them always had a depressing effect on the kanakas. Friday was the favourite day for a big effort, and when suitable weather conditions and a steamer with good cargo handling arrangements were combined, they would frequently "give it a go." It may be asked what happened when the record was broken? Those of the whites who desired it were allowed a free issue of lager to celebrate the occasion, and the kanakas were each given a liberal allowance of golden syrup, a preparation which was particularly dear to their hearts. All hands, men and women, participated in the latter, and so the general interest in the event was stimulated.

The system of lightering which was developed at our islands was unique, various captains having told me that they had never seen the same method in other parts of the world. The surf and reef conditions did not permit of using large lighters, as is customary in sheltered waters, but our handy surfboats with all their cargo contained in either four or six large baskets ready for heaving aboard, gave results comparable with lightering under much more auspicious circumstances elsewhere.

And so the work went on, the position improving steadily at each island, the more so as we had caught up with the demand for phosphate fairly well, and were able to give increasing attention to labour-

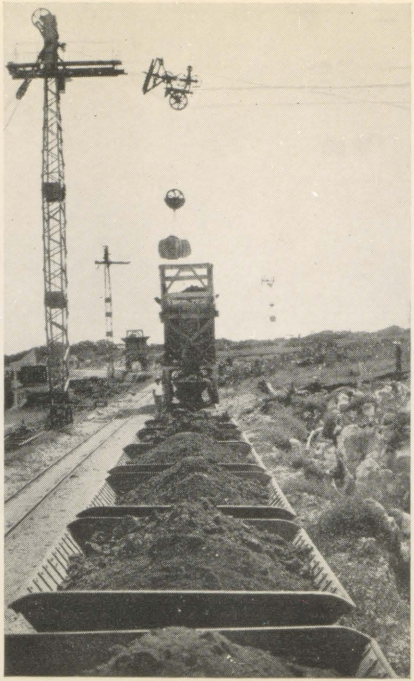
saving methods, which not only permitted of reducing the number of kanakas, but also made things easier for the labourers generally. Above all, we were able to give quicker despatch to vessels, the keynote to success. The size of vessels in the trade had continued to increase, the largest one being the *Baron Erskine*, which loaded 8800 tons at Ocean Island in 1913.

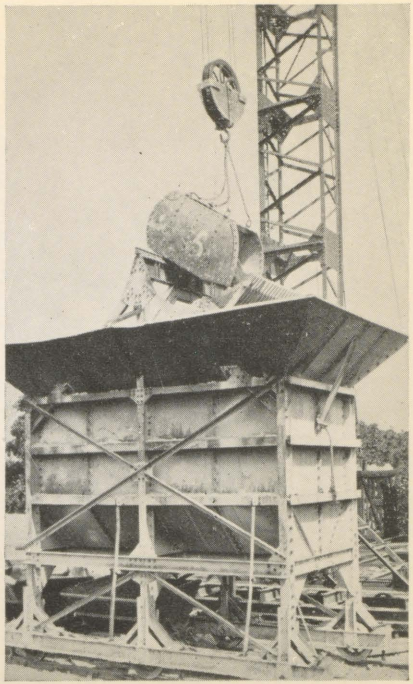
During this six year period, we shipped from—

Ocean Island	1,020,800	tons
Nauru	630,656	„
Total	1,651,456	tons

Equivalent to an average output per annum of—

Ocean Island	170,133	tons
Nauru	105,109	„
Total	275,242	tons





TIPPING PHOSPHATE FROM CABLEWAY SKIPS INTO HOPPERS FOR LOADING INTO TRUCKS, NAURU

CHAPTER XV

"MEN MAY COME AND MEN MAY GO"

DURING the period covered in our last chapter, many important changes occurred at Ocean Island and Nauru, and new faces were more frequently seen, an obvious sign of progress.

Towards the end of 1907 Mr A. R. Dickinson, from the London office, visited both islands, having come out by way of China, where he was interested in engaging the first Chinese labourers and mechanics for Nauru. He was favourably impressed by what he saw at the islands, and the local knowledge acquired during the visit, together with a further one in 1913, when he was Joint Managing Director, proved invaluable during his subsequent long connection with the industry.

The Resident Commissioner, Mr W. Telfer Campbell, did not remain long after the transfer of the seat of government to Ocean Island. He and Mrs Campbell went south in December 1908, and his period of administration of the Gilbert and Ellice Protectorate terminated after a long and strenuous service of about fifteen years. During his regime a great deal was done in the best interests of the natives of both groups, by whom he is remembered with respect to this day.

During 1909 we had Mr Arthur Mahaffy, of the Western Pacific High Commission, Fiji, as Resident Commissioner for about six months, followed shortly after by Captain J. Quayle Dickson, D.S.O. Mr Mahaffy refers to his official experience at Ocean Island in the *Blackwood's Magazine* article as follows:

> The now considerable population of the Island, consisting of so many different elements, lives in wonderful harmony and peace. Crime is almost unknown, and during the six months in which I had the honour to represent the arm of the law as Resident Commissioner, one solitary court case came before me. It was the theft by a Japanese of some stores. Disturbances among the native population, or the indentured labourers, are of extremely rare occurrence, and I gladly bear testimony to the very great humanity and kindness with which the officers of the company treat the mixed native population.

Unfortunately this good record was upset shortly after Mr Mahaffy's departure, when one of the Gilbertese lost his life through a fellow-islander evidently going out of his mind.

With the increased number of labourers on the island, our police force had been brought up to nine, with a white police officer in charge. In view of the Protectorate officials now being permanently stationed at Ocean Island, it was arranged that the Government should take over the policing of the community, and accordingly our civil force was disbanded. The Deputy Commissioner, Mr C. Workman (later C.B.E.), was the first to occupy the position of Chief of Police, and he speedily put things on an excellent

basis. In an official letter to me when the change was made, Mr Mahaffy alluded appreciatively to the humane and kindly treatment of the native labourers in the Company's employ.

An outstanding event early in June 1909 was the arrival at Ocean Island of the s.s. *Ocean Queen*, on her first voyage, with Mr Arundel and his family on board. This vessel had been built for our trade by Norwegian shipowners, and was fitted with a special mooring windlass and other devices for lowering and raising the deep-sea moorings at our islands. She was a fine vessel with good passenger accommodation, suitable cargo-carrying capacity, and satisfactory arrangements generally. We were very hopeful that she would prove a great acquisition in connection with our operations, such a vessel having been under discussion for a number of years.

The designers of the mooring windlass, however, had not sufficiently provided for the arduous nature of our work, and when lowering the "up and down" portion of a set of moorings at Nauru, the windlass carried away, a new four-inch steel wire "stopper" snapped, and the four-ton anchor, 160 fathoms of chain, and 90 fathoms of seven-inch steel wire hawser, "took charge," going to the bottom with a run, and of course all was lost. The consequences might easily have been much more serious. Mr Arundel, in his report on the accident, stated:

> I was on the bow of the steamer watching the paying out of the wire rope, and on hearing the fearful grinding noise and seeing the end of the chain leap into the ocean blue I

rushed aft, expecting to find legs and arms and mutilated bodies all over the deck, but mercifully the chains and wire rope had kept in a straight line and thus no casualty occurred.

This accident impressed us more than ever with the necessity of having a very big margin of power in any mooring windlass or winch for doing such work.

Unfortunately, worse was to follow with the *Ocean Queen*. The Deputy Chairman and party left on her for Makatea shortly after, and when passing to windward of that island close inshore something went wrong with the machinery. The engines stopped, and before the trouble could be adjusted, the vessel drifted on the reef, soon becoming a total wreck.

This proved to be the last time our honoured Deputy Chairman was on Ocean Island or Nauru. He was then well on in years, his health was not good, and was naturally affected by these events. His later years were spent quietly in England, though his interest in island matters continued keen to the last, for he was still with us in spirit.

Turning back the pages of memory to the early days, a good many years before Ocean Island was thought of, I reflect with much pleasure on my close association with our old chief, Mr John T. Arundel. In those strenuous times, when the business was in its infancy and when there was very little in it for any one, he nevertheless laid the foundations of this industry well and truly. He established traditions which in no small degree have conduced to the present success of the enterprise. In the old days,

we experienced times when everything seemed to go wrong, when the stars in their courses seemed to be fighting against us, moorings carrying away, vessels wrecked, money flowing away like water. But he always rose above such circumstances; a splendid example of an English gentleman. Mr Arundel had a soft spot for the natives in any part of the Pacific where his interests were centred, and their name for him, Aneru, was almost a household word. In earlier years he sometimes took charge of operations on the island being worked at the time, and as an instance of the various ways in which the natives learn their English, he used to tell the following story.

The kanaka labourers planned to have a feast on a certain occasion, but the only few pigs on the island were the property of the Company, and the question was, how could they be secured? The native teacher, an elderly Hawaiian, was deputed to negotiate the important matter. He decided on a letter in scriptural language, and in due course Mr Arundel received the following:

DEAR ANERU,—

If thy servants have found favour in thy sight and thou would'st deal kindly with thy servants, please make them a present of three pigs, for thy servants are very fond of that vegetable.

Needless to say the pigs were forthcoming; the feast would not have been a feast without them.

Another Hawaiian, a sailor, once gave my father a strange version of English as he viewed it, and I

narrate the story with an apology to our American cousins. A smart little schooner had just arrived from Honolulu, and as she tacked backwards and forwards in front of our settlement, my father, who was on the jetty, remarked to the native sailor:

"My word, Pila (Bill), that schooner sail very well."

"Yes, sir," said Pila, "I know that schooner, she sail like h—l."

Father was horrified. "That talk no good, Pila; good Englishman he no talk like that."

"Yes, sir," said Pila, quite aggrieved that his knowledge of the white man's language should be questioned. "I know, that no English, that American!"

On another occasion in those earlier years, our engine-driver, going to the labourers' quarters, was surprised to hear a string of particularly forceful and lurid language—in English, of course. Going inside, he found an elderly native sailor, Lauti by name, and round him was a circle of young fellows, a class in fact. "No good you talk to the boys like that, Lauti," said the engineer. "Oh, well, you know," said Lauti apologetically, "the boy he like to know how to growl!"

It is at least unfortunate that the natives frequently consider it necessary to have recourse to their scanty knowledge of English to express the warmth of their views. Generally speaking, pidgin-English is a most useful language, and is adopted by various nationalities throughout the Pacific as the means of communication with the kanakas. On Nauru, for

instance, the Germans used it continually with their native servants. On one occasion I chaffed an official about this. "Yes," he said gravely, "we have to do it; you see, there is no pidgin-German."

Quite a number of Banabans with their families returned to their island home during these years, principally from Honolulu and Tahiti, where they had gone in labour-recruiting vessels a long time previously. The news of the phosphate developments at Ocean Island had spread throughout the Pacific, and naturally attracted these absentees. While the work of repatriation was pleasing in this respect, it had a very serious result that could not be foreseen. One of these natives had become infected with the island type of leprosy which takes a long time to incubate, and as will be seen later, the disease started among the Nauruans, though not affecting the Ocean Islanders at all.

We had several visits during this period from Messrs J. M. and H. E. Coane with beneficial results to the engineering side of the operations at both islands. An outstanding event in this connection was the first conference held at Nauru in March 1911, attended by Mr J. M. Coane, Mr A. Harold Gaze and both island managers, with their heads of departments. On this occasion, when Mr J. M. Coane presided, various problems in connection with the industry were dealt with, and plans made regarding the future. The important decisions arrived at materialized later in improved plant and methods of working.

In December 1910, Mr G. I. Ellis, after many years of useful service, relinquished his position as manager at Tapiwa settlement owing to indifferent health. On Howland Island in 1888, he had a bad dynamite accident when blasting fish on the reef for the kanakas' rations. Owing to a defective fuse, a whole plug exploded in his hand, and though he made a wonderful recovery, there were lasting after-effects, calling for much fortitude.

My own period of service as island manager terminated towards the latter part of 1911, when the London Board agreed to my wish to retire from the position. Though my health had kept up very well, the strain had been felt a great deal, for during the latter part of 1909 sudden bereavement had fallen upon my little daughter and myself. The plot known as God's acre on each island bears mute witness to such occasions, when a wave of sorrow and sympathy would sweep over the whole community, for the isolation seemed to bring it home very forcibly to one and all.

It was with very mixed feelings that I made the change. At the early age of twenty-four I had been placed in the senior position at the islands, with its responsibilities and anxieties, holding it for eighteen years, eleven of which had been spent on Ocean Island. Looking back, it has been a wonderful experience, a strenuous and stirring life that called for initiative and resource, in fact a man's job.

The following year, at the invitation of the Board, I visited London, where again changes had taken place, the Chairman, Lord Stanmore, having passed

away a short time previously. He had been in that position from the inception of the Company, experiencing the anxiety of the difficult earlier years, and his friendly letters to me from time to time had been very encouraging. Probably he was better known as Sir Arthur Gordon, when Governor of Fiji and afterwards Governor of New Zealand. Lord Balfour of Burleigh was the new Chairman of the Board, and he too continued in that position up to the time of his decease. On the occasion of my visit I was appointed local director with residence in New Zealand, the understanding being that I should visit the islands when required by the Board, and be available for any other special duties.

Mr W. Cleeve Edwards, who had been the head of the civil engineer's department at Ocean Island, and an experienced man in his profession, succeeded to the position of manager there. A change also took place in the administration about this time, Captain J. Quayle Dickson, D.S.O., who had been Resident Commissioner for three years, being transferred, and his place taken by Mr E. C. Eliot.

In March 1914, Captain P. Theet relinquished his position as island manager at Nauru after a very successful term of nearly seven years' service there. Much progress was made under his able management, and there was a minimum of friction with the German interests. The captain stood up to them very well indeed, and they admired him all the more for doing so, referring to him among themselves as *der alte Fuchs* (the old fox). Not long before he left, they played a clever trick which

afforded them great delight. There was a rifle club at Nauru of which the captain was a leading member. He was a good shot, and quite prided himself on the fact. The target for a special competition was a wooden rooster at a good long range. When Captain Theet's turn to shoot came, down went the rooster. There was great excitement and subsequent celebrations in German style with complimentary speeches. It was only after the captain left Nauru that he heard how a long string had been attached to the rooster, and pulled when he fired.

A short time previously an unusual event occurred at Nauru, where a powerful wireless station had been established. Two warships of the German Pacific squadron, the *Scharnhorst* and *Nurnberg* called there *en route* to Samoa, and made fast to our moorings. We little imagined what these names would mean to us not long after, and our thoughts turn more to Coronel than to the Falklands as we reflect on the gallant manner in which the traditions of the navy were upheld by Admiral Craddock and his men.

Toll for the brave, the brave that are no more.

CHAPTER XVI

THE GREAT WAR, 1914-18

THE momentous events of August 1914 came like a bolt from the blue on the little communities at Ocean Island and Nauru, as with many others located at the Empire's outposts. Those of us who had come in close touch with the Germans individually, had probably heard more of the sentiments underlying *Der Tag* than most of our fellow countrymen had done, but such talk had gone on so long that we had taken it more as a matter of course, and did not apprehend serious trouble.

Following on the outbreak of hostilities, the position at Nauru soon became very involved and unpleasant. The Company's staff there at the time consisted of two-thirds British and the remainder German, including the manager, who had succeeded Captain Theet. Fortunately the Administrator, Herr Wostrack, was a sensible and fair-minded man, and there was reason to think that he did a good deal in restraining the others who soon developed aggressive behaviour towards the British. Apparently, however, his hand was forced as martial law was proclaimed later on, and various vexatious regulations were brought in which appeared unnecessary, in view of the fact that the local government was supported by

an armed force of about fifty native constabulary under an efficient police officer. The senior British official on our staff, Mr Joseph Clarke, handled the situation prudently and wisely, and the others behaved sensibly under the difficult circumstances, but the position became worse, culminating in an order for the deportation of all the British. They left by the Norwegian steamer *Frithjof* on 5 September for Ocean Island, remaining there pending developments.

A few days after their departure from Nauru, H.M.A.S. *Melbourne* arrived there, landed an armed party and put the wireless station out of action. The island was not, however, formally occupied at that time, as Herr Wostrack pointed out the difficult position he would be in with the large number of Chinese and kanaka labourers if he had no authority. He undertook, however, to hand over when called upon to do so.

Meanwhile various representations had been made by the London Board stressing the urgency of the situation, and about two months after, our chartered steamer *Messina* brought up a force of Australian troops under the command of Colonel (later Brigadier-General) Holmes. She called first at Ocean Island, took aboard the Nauru staff who had been previously deported, then went across to Nauru, and on 6 November 1914 the British flag was formally hoisted. All the Germans were taken to Sydney, where the Administrator, Herr Wostrack, and the doctor were released; the rest were interned in Australia during the period of the war. Colonel

Holmes returned to Rabaul by the *Messina*, leaving Captain Norrie in command of the local garrison and the civil administration.

A few days after the occupation of Nauru, a Japanese cruiser and a troopship arrived off the island, probably about the time that they occupied the Caroline and Marshall Islands to the north of the equator, which they still hold.

Phosphate operations at Nauru had been stopped when the deportation of the British members of the staff took place, but on their return, work was resumed, and nothing further of special moment happened during the war. At Ocean Island the possibility of a visit from an enemy raider was recognized and the British residents with the native constabulary were organized for resisting any such event; the difficulty of landing through the surf would no doubt have constituted a good "first line of defence."

In all thirty-five members of the staff, including some of the heads of departments, took an early opportunity of going to Australia and New Zealand for service at the front; of these, four made the great sacrifice. After the war most of those who survived returned to their positions at the islands, and expressed themselves as being very glad to get back to peace-time duties again. Two members who are still there gained distinction—Lieutenant F. F. Christian, M.C. (with bar), and Lieutenant J. R. Miller, M.M. A number of Gilbertese also enlisted, and two Banabans, but the Armistice was proclaimed before their training was completed. That the Ocean

Island natives took a very practical interest in those troublous times was evinced by their gift of £1000 in a lump sum to the Prince of Wales War Relief Fund.

Shortly after the outbreak of hostilities, the London Board took the necessary legal steps in connection with the shares in the Company held by enemy subjects. As a result these were vested by the Board of Trade in the Public Trustee, by whose order they were put up at public auction in July 1917, a large British shipping company being the purchasers.

An interesting fact came out during the sitting of a Royal Commission in Australia appointed for the purpose of inquiring into the position of German commerce in the Pacific when the war started. In the evidence it transpired that the industry carried on by the Pacific Phosphate Company Ltd, at Nauru was the only instance in which German interests had been "peacefully penetrated" by British commercial enterprise. In every other case the opposite had happened, and to a very material extent.

The first British Administrator at Nauru following on Captain Norrie was Mr C. Workman, previously in the Gilbert and Ellice Islands Colony service. He arrived there on 24 December 1914, and held office until December 1917, Mr S. F. Anderson, also from the Colony service, relieving him on several occasions. On the transfer of Mr Workman, Mr G. B. Smith-Rewse became Administrator, continuing in that position until June 1921.

Mr W. Cleeve Edwards had, as Island Manager,

general control of the Company's operations on both Ocean Island and Nauru during this momentous period, and when he was absent from either island his deputies were Captain Roberson or Mr J. Clarke at Ocean Island, and Mr J. M. Thompson at Nauru. In 1916 Mr Clarke left to go on active service, and he was followed by Mr Thompson in 1917. Owing to ill health, Mr Edwards retired from the Company's service in December 1918. He was succeeded at Nauru by Mr J. M. Thompson, who returned from active service in 1919, and at Ocean Island by Mr W. F. Stevens, who remained there as manager until he left the islands in September 1920.

During the period of the war the reduced staffs at the islands carried on as best they could. Tapiwa settlement was closed down, and phosphate shipments were greatly reduced. The importance of keeping Australia and New Zealand supplied with their full requirements of phosphate was recognized by the authorities, and we were therefore able to get tonnage for that purpose at a time when it was being very rigidly controlled. This afforded good evidence that the phosphate trade was looked on as being a basic industry, and there is no doubt that the shipments from Ocean and Nauru were a very important factor in maintaining production in the two countries during that critical time. Some pre-war charters materially helped to keep freight costs down, and altogether the farmers had the benefit of exceptionally cheap supplies of superphosphate during the

war period, as compared with other countries where prices increased by 150 to 200 per cent.

Though there were no outstanding developments in the plant and other equipment at the two islands during the period of the war, and the following two years, a lot of useful work was done in the way of consolidating the position. The drying machinery was further improved, storage bins enlarged, and general facilities increased. Through force of circumstances the industry had to become more self-contained and independent of outside assistance. For instance, it became practically impossible to get new launch engines of the special type required. At Nauru the mechanical and electrical engineering department had reached such a state of efficiency that several engines were made at the workshops, the casting and everything being done there. They gave quite as good service as the ones previously purchased.

Shipments of phosphate from the two islands during the period 1914 to the middle of 1920, when the change of ownership occurred, were:

Ocean Island	676,700 tons
Nauru	566,100 „
Total	1,242,800 tons

The approximate annual output averaged 104,107 tons for Ocean Island and 87,090 for Nauru. Both figures were of course very much below output capacity, but the trade during the period concerned was naturally much dislocated. In 1916 Nauru shipments exceeded those of Ocean Island, and the

lead has since been maintained. Nauru also broke the record in 1917 for a day's shipment, sending off 2010 tons to the *Ooma*, working two shifts.

The wireless station at Nauru, which had been put out of action by H.M.A.S. *Melbourne*, was speedily restored for service on the British occupation, and not long after, a station was established at Ocean Island. It is related that following on the two islands getting into wireless communication, the Ocean Island operator, when calling Nauru on one occasion, was much surprised to receive a reply slowly tapped out to this effect—

Master he go catch 'em *kai-kai* (dinner). You try again half-hour.

This was from the Nauruan houseboy who, with the aptitude of his race for learning, had picked up some knowledge of transmitting.

It would be impossible to overrate the value of wireless to our industry. To a large extent it seems to have dispelled the isolation. In the early years it was sometimes months before the island managers could get replies from Australia to their communications; with the installation of wireless, messages were frequently answered the following day. Being in such close touch with the islands has facilitated arranging the movements of shipping, and in fact has assisted the operations in a hundred and one different ways. Communication between the two islands was anticipated in the early days when wireless was still in its infancy, and in fact before operations were commenced in 1900 the Banabans and

Nauruans had already exchanged some messages by means of their tame man-of-war hawks. A well authenticated record exists of the 160-mile journey having been done by one of these birds in two hours. When the Admiralty in England ceased using carrier-pigeons for the purpose of communication, it was considered that a pigeon post could be advantageously established between the two islands. Accordingly a number of the best birds from the naval lofts were purchased and brought out in charge of a bluejacket. They thrived at the islands, and a number of fine healthy birds were reared, but they proved a failure for long-distance flights. The only opportunities of training them on such small islands were when vessels took their departure, and these were found to be quite inadequate for developing them sufficiently for flying between the two islands. The difficulty as regards inter-island communication was, however, ultimately overcome, as will be described.

Important changes took place in Melbourne office during the years 1914-19. The Chief Representative, Mr A. H. Gaze, retired owing to advancing years, and the position was filled by Mr A. J. King, from London office, and Mr A. Harold Gaze as Joint Representatives, the latter having been Assistant Representative for a considerable time previously. Mr Gaze, Senr, had held office since 1900, and his clear judgment and marked ability for organization were of great value to the Company's interests during a strenuous and difficult time.

PART III

PROGRESS OF INDUSTRY UNDER GOVERNMENT OWNERSHIP

CHAPTER XVII

A CHANGE IN CONTROL, 1920

It is so frequently asserted that fact is stranger than fiction, that there must be something in the saying. Certain it is that in the early years of our industry, long before Ocean Island and Nauru were thought of, when the old Company had a hard job to keep going, there was no fiction contemplated so strange as the fact that in 1920 the business should be bought out by three governments conjointly for the sum of £3,500,000. Even at this great price, the purchasers bought wisely and well, as events have proved. How did it all come about?

After the Peace of Versailles, the future of Nauru, with the other Pacific islands formerly under the German flag, came under the consideration of the Allies. German New Guinea and the adjacent large islands, also Western Samoa and Nauru had been occupied by British forces, British commercial interests predominated there, and the Mandate to hold them naturally fell to Great Britain. During the ensuing London Conference, at which the Right Honourable W. M. Hughes represented Australia, and the Right Honourable W. F. Massey represented New Zealand, it was decided that Australia should administer the Mandate for New Guinea and

the adjacent islands, while Western Samoa should be administered by New Zealand.

Regarding Nauru, however, there was a decided difference of opinion. The Prime Ministers of both Australia and New Zealand were fully aware of the necessity for assured supplies of high-grade phosphate in connection with the development of their respective countries, a matter which their agricultural departments had been stressing for some time. The deposits on Nauru and Ocean Island met the case as regards quantity, quality, and proximity to the shores of the two countries, and therefore the interests of both countries should be safeguarded. In view of the great importance the two Prime Ministers attached to the matter, the Secretary of State for the Colonies, Lord Milner, came to the conclusion that the United Kingdom should also be represented in any arrangement that might be arrived at.

The deliberations of the three statesmen resulted in the Nauru Agreement of 2 July 1919 (see Appendix D), entered into between the governments of the United Kingdom, Australia, and New Zealand. This in brief provided for taking over at a valuation the entire interests of the Pacific Phosphate Company at Nauru, and for the future administration of the island under the terms of the Mandate. Provision was made for the working of the phosphate deposits by a Board of Commissioners consisting of three members, one to be appointed by each of the partner governments, and holding office during its pleasure. The amount to be paid to the Pacific

Phosphate Company was to be provided by the governments in the proportion of:

United Kingdom	42 per cent
Australia	42 per cent
New Zealand	16 per cent

Each country was entitled to an allotment of phosphate in this proportion, but in the event of the quantity not being required by either country, it could be taken by the others, or sold by the Commissioners in the open market. The agreement provided that interest on the capital, and a sinking fund for its redemption, should be paid to the partner governments by the Commissioners from the proceeds of the phosphate, and that the undertaking generally should be run on strictly business lines.

The ensuing negotiations with the London Board of the Pacific Phosphate Company resulted in the interests at both Nauru and Ocean Island being acquired by the partner governments, the price being agreed at £3,531,500, which included compensation to certain parties connected with the business.

The Board of Commissioners as set up by the three governments consisted of: Mr A. R. Dickinson, C.M.G. (now Sir Alwin Dickinson, K.C.M.G.), Managing Director of the Pacific Phosphate Company, as representing the United Kingdom; the late Mr J. R. Collins, C.M.G., Secretary to the Commonwealth Treasury, who was then in London on other business, representing Australia; and to my surprise Mr Massey invited me to represent New Zealand, an honour I fully appreciated and was glad to accept.

The Nauru Agreement was duly ratified by the parliaments of each country, and the business was taken over as at 30 June 1920, shortly after which date the three Commissioners met in London. At the subsequent Board meetings the lines on which the business should be run were fully discussed and agreed upon.

The title decided upon was The British Phosphate Commissioners, and the central office was to be at Melbourne, in charge of a principal executive officer; Melbourne is a convenient centre, being near to the scene of operations and to the principal markets. The importance of retaining the services of experienced members of the staff was fully recognized, and the position of head of the executive staff was offered to Mr A. Harold Gaze and accepted by him. Comparatively few changes were made in the personnel of the staff at the various offices and at both islands; experience counts in all business, but particularly in one with the unique conditions existing on these islands. The change-over was thus duly effected with a minimum of dislocation, and a new era of operations at Nauru and Ocean Island was entered upon, continuing to the present time, the industry, though a government owned one, being run on the lines of a commercial enterprise. The new form of control has been attended with marked success and the progress made is outlined in the next chapter.

On the Board of the British Phosphate Commissioners, a number of changes have taken place since the inception of the Commission in 1920. Sir Alwin

COMMISSIONERS WITH SOME MEMBERS OF EXECUTIVE STAFF

Front row: Mr Clive McPherson, C.B.E. (Australian Commissioner); Mr A. S. Gaye, C.B. (U.K. Commissioner); Mr A. F. Ellis, C.M.G. (N.Z. Commissioner).

Back row: Mr F. F. Christian (Nauru Manager); Mr A. Harold Gaze, C.B.E. (General Manager); Mr J. M. Thompson (Assistant General Manager); Mr H. B. Maynard (Ocean Island Manager).

Dickinson, K.C.M.G., continued as the representative for the United Kingdom until April 1930, when he resigned, after a long and valuable association with the industry, and the late Sir George Saltmarsh was then appointed. He visited Australia and New Zealand shortly after and obtained a good insight into the business there, but unfortunately lost his life in a tragic railway accident only a few days after returning to England. Mr T. Lodge, C.B., was appointed to the position in June 1931 and visited Australia, New Zealand, and the islands. Not long after his return to England, his services were required for the Commission set up to administer the affairs of Newfoundland, to which he was transferred in February 1934. Mr A. S. Gaye, C.B., O.B.E., formerly Commissioner of Crown Lands, was appointed United Kingdom Commissioner as from 1 April 1934, and he has already paid a visit to Australia, New Zealand, and the islands.

As to the representation of the Australian interests on the Board, the late Mr J. R. Collins's appointment was of a temporary nature in view of his other important duties in London, and it terminated when the meetings were over. Mr Harold B. Pope then held office as Australian Commissioner up to August 1926, when Mr Percy Deane, C.M.G., of the Prime Minister's Department was appointed temporarily until April 1927; Mr Clive McPherson, C.B.E., then became the Commonwealth representative on the Commission, which position he still occupies.

Of the principal executive officers of the Commission, Mr A. Harold Gaze, C.B.E., still occupies

the responsible senior position as General Manager. Mr J. M. Thompson, A.M.I.E(Aust.), who had held the position of island manager at Nauru from early in 1920 to April 1924 with much credit, was transferred to Melbourne office to take the position of chief engineer; in 1927 he became Assistant General Manager also, a position which had been occupied by Mr W. Chambers, who left for Sydney early in 1927 to enter into shipping business, acting also as agent for the Commissioners in New South Wales. Mr M. Thom followed Mr Thompson as island manager at Nauru, continuing up to April 1933—a very useful term of service. He was then transferred to a responsible position in England, and Mr F. F. Christian was appointed in his place at Nauru.

Messrs Thompson, Thom, and Christian are technical men who entered the island service early in their careers, during 1909, 1908 and 1910 respectively; they have worked their way up to senior positions, a procedure which is found to be much more satisfactory than engaging outside men as island managers, however capable they may be. The same practice applies to the positions of heads of departments; the younger men of the island staffs are moved up as opportunity occurs, their length of service, ability, and general fitness for responsibility being taken into consideration. In this way we not only get efficient staffs, but also have senior men accustomed to the unusual conditions of island life.

At Ocean Island, Captain W. Macfarlane of the marine department held the position of island man-

ager very satisfactorily from September 1920 to December 1925, and was followed by Mr A. A. McLintock, in a useful term of nearly six years. Mr F. F. Christian took the senior position at the island from early in 1931 to May 1933 when he was transferred to Nauru, and Mr H. B. Maynard, F.C.S., who had also been in the service a long time, was appointed manager in his place.

The first Nauru administrator appointed by the Commonwealth Government under the new arrangement was Brigadier-General T. Griffiths, C.M.G., D.S.O., who arrived at the island on 10 June 1921, relieving a British official, Mr G. B. Smith-Rewse. Under his capable administration, law and order were well maintained, and much progress was made in matters pertaining to the welfare of the natives, as is shown in the official reports to Geneva regarding the working of the Mandate.

Anxiety was caused through the discovery in 1920 that a number of the Nauruans were suffering from leprosy, and prompt measures were taken to deal with the trouble; a specialist was sent up by the Commonwealth Government to investigate, and to advise the local medical officer. The latest treatment was introduced, and is proving effective, so there is good reason to think the disease will be stamped out in a few years, particularly as there is every opportunity for maintaining close control on such a small island. The trouble is confined to the Nauruans, and is evidently in a mild, though obstinate form. To the casual observer the great majority of inmates of the segregation village have very little the matter with

them. They keep up heart particularly well, and co-operate fully with the authorities in the measures being adopted for their cure.

On 28 June 1927, General Griffiths was relieved by Mr W. A. Newman, M.B.E., who also was appointed by the Commonwealth Government. The same satisfactory conditions regarding the maintenance of law and order continued, and though the Chinese force increased from 850 in 1927 to over 1000 in 1928, and up to 1100 in 1930, no difficulty of any moment occurred. As previously, full particulars regarding the administration of the Mandate were given in the printed reports to the Council of the League of Nations. Mr Newman's term of office expired on 16 January 1933, when Commander R. C. Garsia, R.A.N., took charge of the administration, and government at Nauru is still under his capable jurisdiction.

At Ocean Island Mr E. C. Eliot continued as Resident Commissioner for the Gilbert and Ellice Islands Colony up to April 1920, when he was relieved by Mr H. R. McClure, who held office until September 1925. Mr A. F. Grimble, C.M.G., was then appointed to the senior position; he had been temporarily in charge at the island on several previous occasions. The administration of the Colony naturally necessitates the frequent absence of the Resident Commissioner, who has to visit the other islands of the two groups, so that occasional acting appointments at Ocean Island are inevitable. In July 1931 the High Commissioner for the Western Pacific, Sir Murchison Fletcher, K.C.M.G., paid an

official visit to the island, and examined the various developments with obvious interest, particularly the arrangements in connection with the welfare of the labourers, both Chinese and kanakas. His Excellency being an authority on such matters, we were gratified to hear that he had formed a favourable opinion. Mr Grimble's term of office expired in September 1933, and early in 1934 Mr J. C. Barley, B.A., an official with extensive experience of island administration, arrived at Ocean Island as Resident Commissioner, and the affairs of the Colony are still under his good care.

CHAPTER XVIII

PROGRESS UNDER THE PHOSPHATE COMMISSION, 1920-35

THE demand for Nauru and Ocean Island phosphate increased a great deal during the years following the war, and it soon became evident that the only way of meeting it was to adopt a policy of active development at both islands. This was put in hand as soon as possible, though it was some years before most of the new plant could be brought into use. Proved methods of handling the phosphate were retained, but the existing arrangements were much improved, the most modern mechanical appliances available were added, and the output capacity was steadily increased. The Nauru cantilever loading equipment was, however, a new departure, and this will be referred to in detail subsequently. The cableways used in connection with mining operations on Nauru were increased, also the mechanical dryers at both islands, the storage bins were enlarged and the railway systems further developed. More staff houses, both for the married and unmarried members, were built and the older houses modernized; accommodation was made for a larger labour force at each island, the hospitals were enlarged and improved, workshops, power-houses, and stores were added to, and their equipment brought up to date.

A very welcome innovation was the installing of electric dust precipitators in connection with the drying plants. The phosphate dust had been the bane of both island communities since mechanical dryers had come into prominence, and the greater their efficiency, the bigger the volume of dust they discharged into the atmosphere, in spite of various measures taken to check it. The engineers calculated that a battery of the latest type of dryers emitted about 80 tons of dust in the twenty-four hours, and when the wind blew towards the settlement, this dust would descend like a pall. It speaks volumes for the women members of the two communities that they accepted the situation with a good grace. The addition of the electric dust precipitators to the dryer batteries at an erected cost of about £20,000 for each proved a thorough success, the efficiency reached by the latest installation being about 98 per cent. The dust thus collected goes by belt conveyors to the storage bins, becoming mixed with the other phosphate, and the material saved is thus a set off to the heavy cost of installing the precipitators.

In 1920 circumstances necessitated dispensing with the Japanese labour employed at Ocean Island, to our considerable regret, as they had given very useful service throughout, and their behaviour had been excellent. The kanaka labourers, then numbering about 600, were supplemented by the addition of about 400 Chinese.

Through force of circumstances we were also obliged to cease recruiting Caroline Islanders for

service at Nauru; this decision was arrived at with regret, as they had proved a very satisfactory class of labour, particularly as regards boat work. A trial lot of New Guinea kanakas was engaged in 1921, but they were not a success, their health suffering on account of the comparative scarcity of native vegetable foods. From 1923 we have relied entirely on Chinese labour at Nauru, and we have found these men excellent for land work. As boatmen they are good in smooth water, but lack the wonderful skill of the island boatmen in handling boats through the surf.

Two more wrecks have occurred at Ocean Island since the Commissioners took over control. On 8 February 1926 the s.s. *Ooma* went on the reef in the bay immediately opposite the native village after which she had been named. Usually such disasters are caused by bad weather, but in this case it was through fine conditions, and the edge of the reef, usually to be plainly seen with the surf breaking on it, was on this occasion hidden beneath an entirely smooth sea. Through an error of judgment, the captain did not realize that the vessel was dangerously close. Efforts to refloat her were unsuccessful, and she was gradually set along the reef to a particularly bad place off Sydney Point, becoming a total wreck.

The s.s. *Ocean Transport* went on the reef in the bay on 30 January 1928; let us hope she will be the last. The accident happened during unsettled weather, and when the vessel was light in ballast.

S.S. *MINA* LOADING PHOSPHATE IN HOME BAY, OCEAN ISLAND. (Two views.)

She was lying at the moorings when a squall came up, suddenly hauling round and blowing onshore; the vessel left the buoy in order to put to sea, but with the force of the squall catching the high bow she could not answer the helm, and was blown round, coming on the reef broadside. Being so light, the surf lifted her right up on the reef, and there she is at the present time, a tragic blot on the landscape, besides being liable to get swept farther in, notwithstanding various precautions which have been taken. She would then badly obstruct the boat harbour, so it has been decided to cut her up with oxy-acetylene, and drop the pieces over the reef —a long and costly operation where a 7000-ton steamer is concerned.

It is at least singular how disaster has attended the three vessels named after Ocean Island. The *Ocean Queen* was lost on her first voyage; the *Ooma* sailed the "seven seas" in safety, and came back to the island, running on the reef within 200 yards of the native village of the same name; the *Ocean Transport* has come to a like bad end. We do not contemplate naming any more vessels after Banaba! However, the five wrecks which have occurred at Ocean Island constitute a negligible percentage of the vessels which have been loaded in the thirty-four years since operations there commenced. With improved moorings and rapid loading arrangements, the risks to vessels have been reduced to a minimum and do not worry the underwriters. Nauru has the enviable record of being free of any marine casualty

since the beginning of work there in 1907. Long may this good record continue.

The shipping departments on the two islands continued their healthy rivalry, the record for a day's work being increased at Nauru to 2189 tons to the *Delungra* in 1922, and 2843 tons to the *Dumosa* in 1923, shipping from only one jetty in each case. Evidently Ocean Island formed the opinion that Nauru was getting "uppish" over this success, and the local correspondent of *The Equatorian*, an inter-island staff publication, who was obviously addicted to doggerel, sent in this contribution:

> Ocean was old Ocean when Nauru was a pup,
> Ocean will be old Ocean when Nauru is swallowed up!

However, on 7 March 1925, Ocean Island took advantage of a suitable day and a vessel with particularly good loading gear. She was hauled into position, and working from two jetties, 3460 tons were shipped to the *Cedarbank*. This figure "put the lid on" in the meantime, as Nauru could not ship from two jetties to one vessel, they being too far apart. I believe it created a world's record for this kind of lightering operation, but still higher figures have since been achieved at Ocean Island. In December 1933, 3169 tons were loaded to the *Weirbank* from one jetty, and in March 1935 the *Cedarbank* again captured the record by loading 3775 tons in a day from one jetty. At Makatea, the French phosphate island near Tahiti, where loading methods are modelled on those at Ocean Island, similar high loading figures are now being attained.

Prior to the commissioners taking over, the highest output in a year was 337,000 tons in 1913. In the thirteenth year of the commission, shipments exceeded 660,000 tons, and the output capacity is now not less than 750,000 tons per annum, which can be increased if required after 1936 to probably 1,000,000 tons upon the completion of the new crushing, drying, and storage plant at Nauru. It seems a lot when we reflect that before Ocean Island was started our objective was 10,000 tons per annum, and we never reached that figure. Such large output figures would be unattainable but for the solution of the problem of direct shipment from the shore to vessels moored in the open sea. This has been satisfactorily effected by the installation of the cantilever loader, from which all Nauru phosphate has been shipped since 1931. A special chapter is devoted to that unique and interesting plant.

The success of the cantilever naturally turned attention to the possibility of an installation at Ocean Island, and of course the staff there began to cogitate on the possibility of going one better than Nauru. However, a detailed survey of the reef at the various points where the marine department considered the cantilever system of loading could be carried out, proved very disappointing. The jagged, serrated nature of the reef edge, and the comparatively shallow water for a dozen or so yards out, meant that a projection of at least half as long again as the Nauru structure would be necessary. This would have run up the cost too much, so in the meantime the idea of mechanical loading has been abandoned.

What has proved a good set-off, however, is a steel cantilever type jetty which was erected by Henry Simon Ltd, of Manchester, about the same time that the cantilever at Nauru was under construction, and this jetty is a vast improvement on the previous ones. There is a greater projection beyond the range of surf, and the conveyor equipment for delivering the phosphate to the loading hoppers at the end of the jetty is very efficient. It has been possible to speed up the shipping with surf-boats a good deal, so that frequently vessels carrying 8500 tons are loaded in three or four days. Not only is a satisfactory proportion of the shipping still handled at Ocean Island, but in the event of the Nauru cantilever being out of action through mooring trouble, the mother island could be counted on for extra duty by increasing the labour force. In this way, as in many others, the fact of the Commission's activities being divided between two islands, is a distinct advantage.

A factor of great importance as regards feeding this new jetty is the recent completion of a new crushing, drying, and conveying unit, which delivers phosphate to the main storage bins. Experience taught us long ago that it is one thing to have jetties which can ship 2500 tons or more per day, but quite another thing to keep them supplied with phosphate at that rate. This plant, which is known as No. 4 unit, was designed by Mr J. M. Thompson, and embodies the experience gained at Nauru in working the efficient No. 2 unit there. In operation it does away with the necessity of bringing phosphate down from the tableland by means of self-acting grade

tramways, the altitude being turned into a valuable asset, instead of being as hitherto a decided drawback. A circular railway system on the tableland works in conjunction with the new unit, and immediately behind the main receiving hoppers a section of the line is carried out on high curving trestle-ways. Handy little locomotives bring the rakes of loaded trucks along this elevated way, and from it they are dumped on sloping screens which separate the rock from the fine phosphate as it falls into a wet bin. The former drops into very large gyratory crushers, and together with the fine phosphate is then run by conveyors to a larger wet bin above the dryers. Automatic feeders there regulate its delivery to four large rotating dryers set in the direction of the slope of the hill. Emerging in a dry state, it is carried by a long conveyor running in the same direction, discharging into the main storage bin, which has a capacity of 40,000 tons. The phosphate, both rock and fine, has thus come down from the tableland in a series of steps, arriving at the bottom in a dry state resembling dusty gravel, and it is then ready for shipment.

This No. 4 unit is very efficient; the four dryers each have a capacity of 20 to 25 tons per hour, so that if running the full twenty-four hours, the output is from 1920 to 2400 tons. The dust-precipitating plant attached to it works particularly well, and indeed without it the settlement would not be habitable. The unit, which took eighteen months to erect, replaces the old Nos 1, 2, and 3 units which were obsolete and worn out, and it puts Ocean Island

in a strong position as regards drying and storage for some years to come.

Latest type cableways are now being installed at the tableland workings, as at Nauru, to work in conjunction with the railway system round the phosphate area; one of these cableways has recently been brought into operation.

At Nauru a No. 3 unit is under construction on somewhat similar lines to the foregoing, but with larger dryers, capable of putting through 70 tons per hour each, while the storage bin is to have a capacity of 60,000 tons. There will be conveyors leading from this to the "shore bin" supplying the cantilever, and the extra storage means that there will be a total bin capacity of 100,000 tons which can be fed to the cantilever by means of rubber belt conveyors without any trucking whatever. We have found hitherto that the bin accommodation sooner or later becomes chock-full, owing to shipping operations being suspended from one cause or another. With the bins full, the work of hundreds of men constituting the field gangs is disorganized, causing great inconvenience and expense. When the large Nauru bin is completed, we shall have ample storage capacity there which, together with about 50,000 tons at Ocean Island, will put us in a strong position. It is interesting to turn back thirty-four years to our first effort at "gravity" storage, the 15-ton hopper at Ocean Island jetty.

Another important development now in progress at Nauru is the change-over of the railway system from two-foot to three-foot gauge. This is ren-

dered necessary by the fact that the phosphate workings are getting much more distant from the drier units. Several more cableways have been installed at Nauru, and two or three have been fitted with powerful electric flood lighting, in order to work double shifts when necessary. The increase of mechanical appliances has necessitated building up the power-house equipment at both islands; at Nauru the total B.H.P. of the several Diesel engines is 2900, and at Ocean Island 2400. A good deal of crude oil is used by these machines, and as it is sent to Nauru in drums, the labour of landing it is very considerable. At Ocean Island of late, the oil has been pumped ashore from the *Triona* by means of long lengths of hose supported by several surf-boats. Arrangements for doing this on a large scale at Nauru, and changing over the drier fuel from coal to crude oil, are now in progress; this will effect a great saving of labour and expense.

A new condensing plant of high efficiency has been installed at Ocean Island in recent years, and numerous large concrete cisterns have been built at both islands, the total water storage now being at Nauru 2,000,000 gallons, and at Ocean Island 3,000,000 gallons. When one contemplates the old-time conditions on the latter island during drought times, the present position is rather striking.

In 1924 a very useful development took place in the installation of wireless telephones at both islands, also on the *Nauru Chief* and, later, on the *Triona*. The service works very well indeed, and has paid for

itself several times over. The managers at both islands are in constant touch, and can thus arrange the movements of the shipping and various details of the local business of the Commission to the best advantage. The two steamers come into the system when within about a 600-mile radius of the islands, with useful effect as regards their cargo discharge and programme generally. When the vessels are labour recruiting in the Gilberts, the telephone is particularly useful.

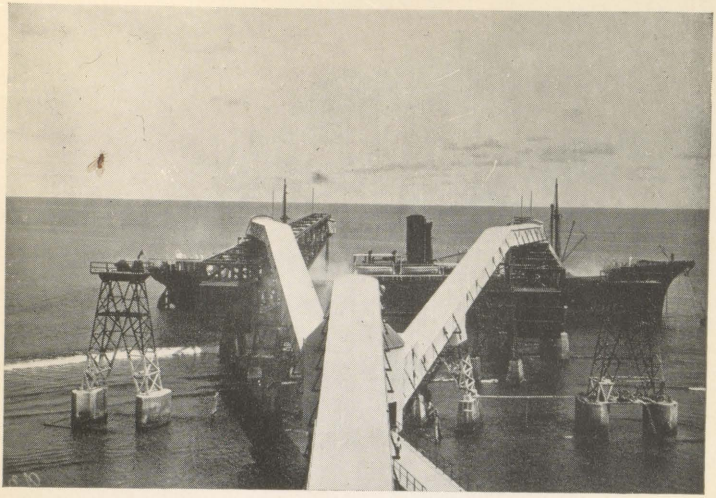
On 30 June 1934, fourteen years of the Commission's operations terminated, and if this time is divided into two seven-year periods, we can readily see what work has been done in the way of phosphate output and where the material has been sent. Perhaps the position can be best shown by means of tabulated data as follows:

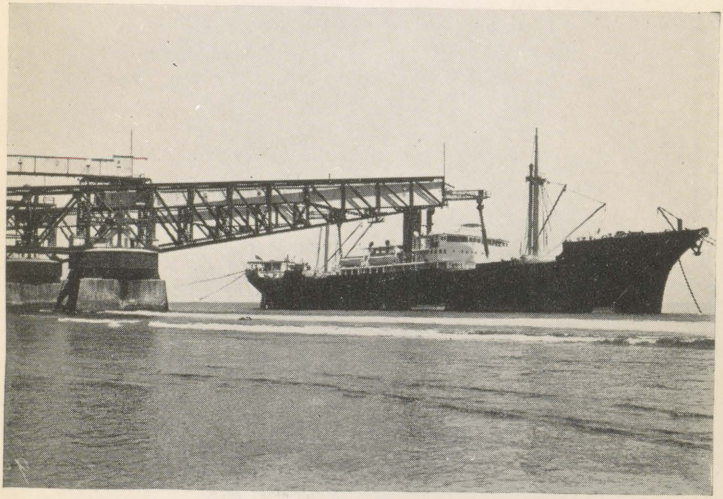
SHIPMENTS FROM NAURU AND OCEAN ISLAND

7 years ended.	U.K. Tons.	Australia. Tons.	New Zealand. Tons.	Other Countries. Tons.	Total. Tons.
30 June 1927	32,000	2,034,576	495,000	385,535	2,947,411
30 June 1934	—	2,520,444	989,485	107,155	3,617,084
	32,000	4,555,020	1,484,485	482,690	6,564,495

If to this total of approximately 6,500,000 tons is added the 3,500,000 tons shipped in the Company's time, it will be seen that the total output of phosphate from the two islands up to 30 June 1934 was about 10,000,000 tons.

The table of shipments shows a small quantity as going to the United Kingdom. Hitherto high





S.S. *TRIONA* LOADING AT THE NAURU CANTILEVER
(Two views.)

freights have been an obstacle to trade, but the British Phosphate Commission does not trade for profit, and under its constitution must sell to the partner countries at cost price; therefore, when freights are low, it may well be that in future it will prove worth while for the United Kingdom to take advantage of its rights under the agreement. From other angles the mother country benefits from her interests in the Nauru and Ocean Island deposits.

The shipments to Australia and New Zealand as shown in the table do not represent the total phosphate consumption of those two countries. Up to the period of the depression, their requirements increased so rapidly that the Commission could not fully meet them, reaching a peak of about 800,000 tons in 1928-9. At the request of the manufacturers we bought a total of approximately 1,000,000 tons of somewhat lower grade phosphate from other sources of supply, the delivery of which was spread over eight years from 1926 to 1934. Such purchases which were unavoidably at higher prices are unnecessary now, in view of the greatly increased output of Nauru and Ocean Island. Improved methods and expanding output have enabled the Commissioners to achieve considerable reductions in working costs, and the quick loading of ships has had a helpful effect in bringing down freights. The result is that prices of phosphate from Nauru and Ocean Island delivered in Australia and New Zealand have fallen more than 50 per cent in fifteen years, until they are now about 30 per cent less than pre-war prices.

The decrease in selling prices has not been done

at the expense of the partner governments, as the Commission has from the commencement of its operations paid interest annually on the capital subscribed for the purchase of the business, together with an annual contribution for its redemption in fifty years. The governments have not had to provide any further capital beyond the original purchase money.

A development which has given the Commissioners much satisfaction was the setting up of a staff provident fund in 1925 under conditions which made it retrospective to 1 July 1920, when the Commission came into being. The fund is now well established and practically all the staff belong to it; in view of the tropical conditions, the island members are on a preferential basis compared with those employed elsewhere. Under this scheme those who put in a long term of service at the islands either have provision for their future on retiring, or have funds for starting in other lines of business if they so desire.

It may be asked, how does the tropical climate affect the health on both islands? That it is hot cannot be denied, and when moving about the phosphate workings it is scorching, but the nights are always pleasantly cool, as one would expect in view of the small size of the islands. There is no malaria whatever, and the Line Island fever, already referred to, evidently has the effect of inuring one to the climate, and so is not regarded seriously, particularly under the existing arrangements for medical attention. The most trying feature about the climate is the fact that there are no winter months, the islands being so close to the equator.

We frequently hear that the exception proves the rule, and this applies to Nauru and Ocean Island in regard to labour troubles being settled on the spot, without sending out an S O S on the matter. On 28 November 1925, however, a bad affair took place at Ocean Island, resulting in the Resident Commissioner asking, by wireless, for a warship to be sent. At the time, the labour force there consisted of about 380 Chinese and 600 kanakas. The character of the Gilbertese is probably realized in view of what has been written regarding them. They are good-natured and singularly free from malice, but hot-tempered when roused, and then quite ready for a fight; the natives of one island, Tabiteuea, are not called "the Irishmen of the Pacific" for nothing. The Chinese under ordinary circumstances are well-behaved and law-abiding, but in times past some few men of bad type have managed to get in and, as might be expected, they fomented trouble.

For some time previously there had been occasional friction between some of the Chinese and Gilbertese, though apparently neither the authorities nor the local management were apprehensive. The Chinese, or some of them, however, prepared to meet trouble if it came to a head; they smuggled in several revolvers and also stole some gelignite, detonators, and fuse from our stocks, for the purpose of making crude bombs. The clash came over some comparatively trivial matter, and during the meal hour the Chinese divided into three parties, brushed aside the few native police who were about, and attacked the Gilbertese single men's quarters, the married men's

village being some distance away. The Gilbertese, who were about equal in number, were quite unprepared, but seeing what was coming, their fighting spirit was quickly roused, and arming themselves hurriedly with sticks, stones, and anything available, they met the Chinese. A stiff fight ensued, for the kanakas from childhood throw stones with extraordinary accuracy and force. The Chinese fired their revolvers and threw the bombs, which were not very deadly affairs. Some of the Gilbertese were wounded, but fortunately not seriously. One of the Chinese was killed by a stone, others were wounded, and in view of the unexpectedly hot reception they retreated to their quarters.

The Resident Commissioner, fearing further trouble, did not consider it expedient to attempt disarming them; they and also the Gilbertese were ordered to remain in their quarters pending the arrival of H.M.S. *Laburnum* on 13 December. An armed force then landed, the Chinese were disarmed, and various measures taken to prevent a recurrence of the trouble. The Gilbertese were, however, much upset over the matter, though the honours were with them so far as the fight was concerned; they went out on strike, demanding that the Chinese, whom they said had not fought fairly in using revolvers and bombs against them, should be sent away. In due course the trouble blew over, and such an occurrence is not likely to happen again. The one satisfactory feature about the disturbance was that neither side evinced the slightest animosity towards the Europeans.

CHAPTER XIX

"THERE GO THE SHIPS!"

YES, there they go! Not the picturesque sailing vessels beloved of the novelist, with their clipper bows, towering masts, and fleecy canvas, but the good solid cargo boats, laden down to their Plimsoll's marks as they leave Nauru and Ocean Island bound for distant lands. Sailing vessels are too uncertain in the strong equatorial current, and in any case they cannot take in cargo at the rate of several thousand tons a day; nor can they put to sea at short notice when bad weather comes up, and the wind blows onshore. The cargo boat plugging along at about 10 knots gets there on time usually, and arrangements can be made accordingly.

Since 1920, however, quite a change has come over the type of boat in the trade. At one time, any old tramp was thought suitable, but now newer vessels with good cargo-handling equipment are required, and frequently modern motor-ships having a better turn of speed are chartered with good results. Vessels carrying up to 8500 tons of phosphate are preferred, though on occasions of late years we have loaded them up to 10,000 tons, but that size puts an undue strain on the moorings. Passenger accom-

modation for members of the island communities used to be a problem, the ordinary cargo boats being at a distinct disadvantage. They usually have only two or three spare cabins at most, and are not exactly comfortable. In fact we have often felt very sorry indeed for the women and children over the real hardship endured on some of the voyages.

For many years it was an unfulfilled dream on the part of us of "the old brigade" to have a steamer built with good passenger accommodation and fitted up suitably for dealing with the many special conditions of the industry. The first move in this direction was the building of the s.s. *Ocean Queen*, which was wrecked on her first voyage in 1909. The next step was the purchase of the s.s. *Nauru Chief* in 1922, a new vessel of 2047 tons net register, with a phosphate carrying capacity of 3400 tons. She was not built for the trade, but various alterations were made, and she has done good service, the experiment proving sufficiently successful to encourage further developments in steamer ownership.

In 1930-1 the s.s. *Triona* was built to our order by Messrs Harland and Wolff at their Govan yards, Glasgow, arriving at Nauru in May 1931. No pains were spared to have a vessel really suitable for the phosphate trade, an objective which has certainly been attained. She has a net tonnage of 2590 tons and phosphate carrying capacity of 6500 tons, with a speed of 11 knots on a moderate consumption of oil fuel or coal, and good accommodation for the island staff. The predominant feature, however, is the efficient arrangement for laying or lifting the

deep-sea moorings which constitute such a vital part of the island operations. The massive mooring winch made by Clarke Chapman and Company is located under the fo'c'sle head; it weighs about 50 tons and has been tested to lift just over 100 tons. From this mooring winch the chain cables and steel hawsers lead out over heavy rollers in the bow, which is clipper shaped in order to facilitate the handling under it of the large 21 feet by 12 feet buoys, and for doing the mooring work generally.

The recognized life of a set of wire hawser and chain moorings is five years, after which they must be renewed with as little delay to the phosphate shipping operations as possible. In earlier years the work of heaving up the enormous length of wire hawser and chain with the five-ton anchor attached was so difficult that the procedure usually adopted was to unshackle the vertical portion near the buoy and let it go to the bottom. The mooring winch on the *Triona* is, however, so powerful that in about two hours the whole thing is lifted; much valuable material is thus saved for further use, and the degree of wear incurred in the five years of hard service is carefully observed. Strangely enough, no corrosion of the steel hawser occurs below 18 fathoms (108 feet), the reason being that the water is not aerated below that depth. Marine growth down to 15 fathoms is very plentiful, and the inshore hawsers in particular, at a depth of 10 fathoms, are covered with seaweed and grass, in which numerous pretty little cowrie shells, crabs, shrimps and even young octopuses are found. Pieces of live coral adhering to the

metal are quite numerous, the largest seen so far being six pounds in weight. On the vertical chains, numerous bright coloured oysters are found. All the material on the inshore hawsers accumulates in two to three years, after which they are "under-run," and one can imagine the interest a naturalist would take in seeing all this marine life coming up from the ocean. No such growth exists below 15 fathoms.

The *Triona* has other special arrangements for the trade, ample refrigerated space for the purpose of taking meat, vegetables, fruit, and other provisions to the islands, and as for labour carrying facilities, she is quite outstanding. Several senior members of the staff went to England to supervise the building and fitting up of the vessel; Captain Macfarlane was in charge throughout, and Mr G. W. W. Cozens, the island marine superintendent and mooring expert, gave particular attention to his section, the mooring winch being made to his general design. Captain Murray M. Johnstone and Mr S. Kersey (chief engineer), both formerly of the *Nauru Chief*, went to England to bring her out.

During her first four years of strenuous service she has quite come up to expectations, and in particular has simplified mooring work a great deal; the main mooring buoys with their attached weight of chain, wire hawser, and 5-ton anchors are picked up bodily and overhauled in a surprising manner compared with previous practice. The vessel carries phosphate economically, and her cargo handling arrangements are excellent; the latter is an important feature, not only as regards loading, but also

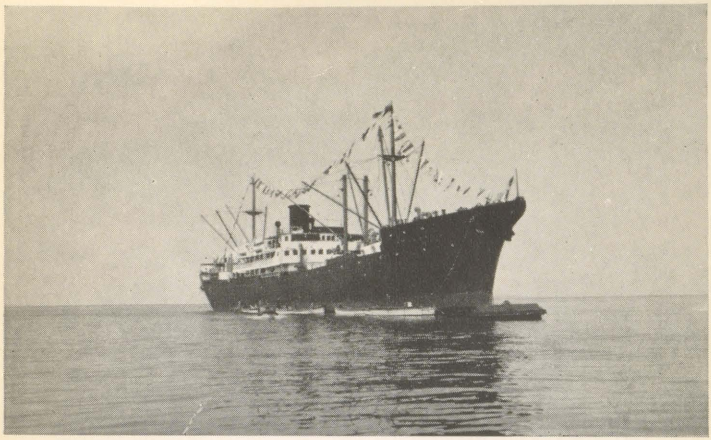


Photo: *A. P. Lloyd*

M.V. *TRIASTER*, AT DISCHARGING BUOY, NAURU

Photo: *A. P. Lloyd*

M.V. *TRIASTER*, DISCHARGING CARGO, NAURU

the discharging, a very important factor in obtaining low freights being the turning of vessels round quickly at their destinations. To the island people, the *Triona* is "our vessel." They have quite a sense of ownership, and when going south after their two years' service on those islands of the "big sun," they say that their vacation commences when they get aboard the *Triona*; that is gratifying, and as it should be. On both the *Triona* and *Nauru Chief* there is a good atmosphere, the indefinable something that means so much to those who are travelling, and which is not determined by the size or appointments of the vessel.

The success of the *Triona* and the importance of safeguarding the mooring position in view of the increasing number of vessels being loaded, has led the Commissioners to build a second vessel similarly equipped. The *Triaster*, a motor-ship, carrying about 1400 tons more than the *Triona*, was launched by Lithgows Ltd, of Port Glasgow, in December 1934, and entered the island service in 1935. She has all the facilities of the *Triona*, with some further refinements added, making for convenient working; all of the winches, including the mooring equipment, are electrically-driven.

In addition to the vessels owned by the Commission, at least two large steam or motor vessels on time charter are employed running regularly between the islands and Australian or New Zealand ports. Other tonnage destined for these two countries is taken on freight charter, Messrs Andrew Weir and Company, of London, getting much of the business.

Occasionally cargoes are sent to Europe on freight charter, but the long distance and high freights limit business in that market. Shipments are made to Japan also, usually in Japanese vessels.

Turning back a good many years, I recollect an afternoon when two captains were in my office, a British and a Japanese, and we were talking of the morrow, which was a special holiday. I said to the former:

"I suppose you will run up your bunting, captain?" The Japanese had not quite heard, and looked inquiringly. The other came to his rescue, and described at some length how all the flags should be tied together, and lines of them run up to the fore and the main mastheads. "You mean 'dress ship,' I suppose, captain," replied the Japanese. Next morning somewhat before 8 a.m. we saw the flags being slowly pulled up on the British steamer, first to the fore and subsequently to the main masthead. Just on the tick of the hour aboard the Japanese boat, lines of flags from for'ard ran up to the fore masthead, and simultaneously from aft to the main, while shorter lines ran out from each top mast, meeting exactly in the middle. It was very neat—"dressing ship" had been done man-of-war style.

What is the procedure when a vessel arrives at the islands? First she has to moor at one or other of the two main buoys; a launch and a boat will be awaiting her there, and the ship's hawser will be speedily run to the buoy. She heaves in, picks up the end of the bridle, taking it in through the hawse-

pipe, and soon it is fast. Meanwhile the government whale-boat with its smart native crew in uniform, bringing the doctor and customs officer, will have drawn alongside. The vessel is soon cleared, and "Q" (quarantine) flag hauled down.

If at Ocean Island, the bay speedily becomes a busy and animated scene; the Commission's whale-boat with the harbour master comes off, and the passengers, if any, are taken ashore. A launch and surf-boat bring off the stevedore and his gang with their loading gear, and a few minutes after, two or three other launches bring loaded boats alongside, assuming there is no inward cargo to land. The vessel's derricks will be up and the hatch covers off, all ready before she comes to the buoy, and soon the winches will be rattling round, heaving up baskets of phosphate at all hatches. Aboard the vessel the full basket is dexterously landed on a tipping block, when it immediately capsizes and empties its load down the hold, then being lowered back to the surf-boat. No time is lost, for if the motto is not "make hay while the sun shines," it certainly is "ship phosphate while the weather is fine." We are assuming on this occasion that the vessel has arrived under fine conditions, for should it be really bad weather there will probably be signals up, at the Commission's flagstaff, "Weather too rough, keep within signalling distance," or something with an equally depressing effect, particularly to any passengers who may be aboard!

At Nauru, if the vessel is ready to take phosphate, the procedure will be quite different, in view of the

method of loading there, as will be described in the next chapter.

Speaking of the stevedore's gang reminds me of an incident at Ocean Island, and the remarkable exploit of one of the Gilbertese from Tamana, Neti (Ned) by name, a modest fellow with the build of a Hercules. It was rough weather and there were some boxes of silver coin to take ashore, for paying off a crowd of time-expired labour. The money was in boxes, each weighing 56 pounds, and the procedure was for the kanakas to carry them on their shoulders down the companion ladder to the surf-boat.

Neti was thus carrying a box, and when half-way down, the surf-boat was swept underneath the companion by a big wave which lifted it high. Coming down with a jerk, the tackle carried away, and Neti with his box of money was thrown into the sea, sinking immediately, of course. The boatmen were looking over the side watching the struggle that was going on down below, when up came Neti; he had recovered the box, which was speedily lifted into the boat. He was rewarded with a month's wages, and to use the expression of the white man in charge of the gang at the time, he was "tickled to death at the idea of earning money so easily!" The island staff, some of whom are great swimmers themselves, still speak of that exploit with wonder.

NAURU CANTILEVER, WITH LOADING ARMS SWUNG INSHORE AND MADE FAST AT MOORING MASTS

S.S. *NAURU CHIEF* HAULING INTO POSITION FOR LOADING AT CANTILEVER

CHAPTER XX

THE NAURU CANTILEVER

PROBABLY every young fellow engaged on anything big, and keen on his work, has visions of some wonderful arrangement which would make all the difference in coping with an outstanding difficulty. "If only such and such a thing could be done, we should be all right!" It is not a bad line of thought, for to realize and experience a difficulty is the usual precursor to overcoming it. We younger men at Ocean Island in the early years had visions of a mechanical loading appliance which would permit of loading phosphate direct to a vessel's holds, thus dispensing with the relatively slow, laborious and expensive operation of lightering. The older men were much less sanguine on the matter, for the bump of caution develops as one gets on. After many years, however, the dream has been realized at Nauru, and strangely enough, the measure of success thus far attained has much exceeded even the dream —a pleasing state of affairs that does not often happen. It may be of interest to trace how this has come about, and to what extent Nauru can now claim to rank among the leading ports of the world at giving quick despatch to vessels.

The problem to be solved was an unusual combination of mechanical and nautical difficulties, and the latter were always recognized as being the more pronounced. How would it be possible to bring in a large vessel close enough to the edge of the reef, in an open roadstead and where there was no anchorage, without incurring undue risk to her safety? In view of the numerous accidents to the moorings, particularly in the earlier years, it seemed as if they constituted an insuperable difficulty, and that the depth of water in which they were laid was altogether too great. This turned attention to some other possible solution of the problem, principally the construction of a dock by excavating a deep channel in the reef, leading inland sufficiently for the basin to be formed. Expert opinion was obtained on the matter, and was adverse to it; the success would be problematic from several points of view, and the cost would be prohibitive. So attention was thrown back on the "gantry," as it was at first referred to, subsequently being spoken of as the cantilever. Plans of various types of these structures were supplied by several engineers extending over fifteen years or more, but always we came back to the question of the moorings.

As time went on, however, and the various weak points in successive sets of moorings were rectified, it became increasingly evident that a vessel could be suitably moored for mechanical loading, under fine weather conditions, without incurring special risk. Experiments were then tried at hauling steamers close inshore temporarily, and observing their "lay"

when alongside the reef; these proved very encouraging, and it was decided to go ahead with the work. During the early years of the Commission's operations, the Commissioners and their executive staff devoted much time and anxious thought to the whole question, and finally the consulting engineers, Messrs J. M. and H. E. Coane, and the Nauru engineer, Mr J. M. Thompson, devised plans on quite original lines, which appealed to us all very much. They were placed before various leading engineering firms in the United Kingdom, and tenders were called, the successful contractors being Messrs Henry Simon Ltd, of Manchester. A very suitable site for the cantilever was found adjacent to the settlement, where the contour of the reef and its solid abrupt nature were practically all that could be desired. The construction of the plant was commenced in July 1927, and the work, under the supervision of the Commission's engineer, Mr F. F. Christian, was completed in September 1930.

The principal feature in the cantilever is a pair of immense swinging arms built on massive pillars near the edge of the reef, and supporting along their length from the centre to the outer ends a system of wide rubber belt conveyors. These arms project from the centre pivot 172 feet, thus reaching out to deep water, and they are so placed that loading can be carried on at the for'ard and after holds of a vessel simultaneously. An extra projection of 28 feet is obtained by means of an extension boom, also carrying the belt conveyor at the end of each arm, so the total overhang is 200 feet. The arms swing

readily, and have sufficient range to be moved from hatch to hatch without shifting the vessel, a vital feature of the system being that when once moored in position she remains there until loaded.

We can perhaps get the best idea of the plant by following the phosphate from the shore bin, which is built end-on to the beach, and which holds 12,000 tons. From this bin it drops through doors at numerous points to a 36-inch rubber belt conveyor running in a tunnel along the full length of the structure, and carrying the material up an inclined gallery, delivering it to what is called the compensating hopper. This holds 250 tons, and is situated on the reef about half-way between the end of the shore bin, and the swinging arms. Emerging from this hopper the stream of phosphate is divided, and two smaller conveyors take it up inclined galleries, where automatic weighing machines are installed, discharging at a point immediately over the centre of each swinging arm. There it drops on the conveyors running to the outer end of the arms as already described, and passing along the extension boom, it is discharged through a two-foot telescopic spout into the vessel's hold.

The plant is electrically driven throughout, and at the seaward end of each arm a little cabin is situated where an operator sits in front of electric controls. A button is pressed and the huge arm swings out until the outer end is near the side of the vessel, then the extension boom is run out, overhanging the hold. Another button is pressed, the conveyors start running in sequence, the door of the

compensating hopper opens electrically, the stream of phosphate emerges, and in a few minutes is dropping into the vessel's hold. Loading is stopped similarly; the door of the hopper is closed, the conveyors discharge their load and then stop running, the extension boom is drawn in, and the vessel is all clear in a few minutes so far as the mechanical plant is concerned. Another touch of the button and the great arm slowly swings right in on the reef to its steel tower mooring mast, where it is secured, the other arm acting in the same way.

While all this mechanical detail was being planned, the mooring department gave similar attention to their side of the installation, and Mr G. W. W. Cozens, marine superintendent at the islands, with about thirty-six years of mooring experience, devised an elaborate system of moorings, suitable for vessels while loading at the cantilever. Briefly the plan was to put down two sets of main moorings opposite the cantilever, connecting the two outer buoys by 120 fathoms (240 yards) of six-inch steel hawser. In operation, the vessel would be hauled in from these buoys towards the cantilever, broadside on, by means of two breast lines from inshore buoys, at the same time slackening up the hawsers connected with the outer buoys. Other hawsers would be run to an inner moorings leading for'ard of the vessel, and also to a similar moorings leading aft. She could thus be hove-in to the site for loading under the cantilever, and arrangements for arriving at the exact spot were to be provided for by having wire

hawsers of the right measurements for the different sized vessels.

When the vessel was in position for loading, the hawsers would be hauled tight and secured, but in such manner that they could be cast off at practically a moment's notice, being fitted with special devices for that purpose called senhouse slips. In effect, the vessel would be kept in position by eight hawsers, four leading out at different angles from the bow, and four from the stern, so that four kept her from coming in too close to the reef, two from moving outwards, one from setting ahead, and one from falling astern. When it was desired to put to sea, the two breast lines would be cast off, and the heavy Manila hawsers leading to the outer buoys would be hauled on. Meanwhile the for'ard and after hawsers would be taken in, and the weight of the outer moorings assisting the operation, the vessel would soon be at the outer buoy. The other hawsers would then be hove-in, returned to the shore, and the vessel would be ready to put to sea. All the hawsers were to be so arranged that in case of emergency they could be cast off from the vessel almost at a moment's notice, leaving her quite free. The hawsers would of course be recovered after her departure.

The system of moorings was duly laid by the mooring department according to this plan in October 1930, the *Nauru Chief* (Captain A. Rhodes) being used for the purpose. It was fitting that she should have the honour of being the first vessel to load at the cantilever, which was done on 21 April 1931 without a hitch. Since then more than 200

vessels have been loaded, without any serious difficulty, carrying over 1,500,000 tons of phosphate, and the captains, one and all, speak highly of the arrangements. The work of hauling in is carried out by the harbour master or his assistants, who are master mariners, and their trained mooring gang. They carry out the operation very expertly, and remain aboard the vessel all the time she is loading.

The specified capacity for the cantilever was 550 tons per hour, which was soon reached. With further experience, it became evident to our engineers that the conveyors could be speeded up, and some minor alterations made which would give a much greater capacity. In due course this was done, and the rate gradually increased to about 1000 tons per hour. On a number of occasions, an 8500-ton vessel has arrived in the early morning, has been boarded and cleared by the doctor and customs officer, then hauled in under the cantilever, loaded, and taken her departure before nightfall of the same day, or less than twelve hours at the island altogether. The largest quantity to be shiped in one day was 10,000 tons to the *Comeric* on 14 September 1933. Such work would be considered very quick despatch in any part of the world, and not only is there a great saving of valuable time, but the element of risk to the vessel's safety is reduced to a minimum, in that she is not under the cantilever after nightfall.

Another great advantage about the plant is the saving of phosphate effected during shipment. With the previous system of lightering, the percentage of loss was unavoidably heavy, particularly under rough

surf conditions, but with the cantilever this loss has been reduced to a minimum.

Of course it is entirely a fine weather system of loading, and no risks are run in this respect, though it is surprising how well the vessels lie under the cantilever when there is quite a heavy surf on the reef, causing the vessel to roll. As to the moorings, they must necessarily be considered vulnerable in that the parting of a single link of chain in the main moorings would dislocate the whole system, and prevent further shipping until the damage was repaired. For this work one or other of our vessels with her special mooring arrangements would be required. These, however, are difficulties which we have always had to encounter, and our equipment is better fitted than ever to meet them. We look on the cantilever as being perhaps the most important development since work on the islands was started, and the way in which the unique and difficult local conditions are met constitute a triumph of British engineering. It is quite an experience to stand on the outer end of the extension boom, high up over the vessel, and see the phosphate streaming along and dropping into her holds at the rate of 1000 tons per hour; the line of surf comparatively close and the submerged rampart of coral-reef showing up plainly in the clear water not far distant.

CHAPTER XXI

A ROUND OF INSPECTION ON OCEAN ISLAND

It is customary for one, or occasionally two, of the Commissioners, with the General Manager, to pay a visit of inspection to the islands every year or two, and it may be of interest to visualize one of these trips, the reader being invited to accompany us in spirit. As a matter of fact, that is the only manner in which he could go; the islands are so much off the beaten track, and accommodation there is relatively so limited, that casual visitors are few and far between. Someone has described Nauru and Ocean Island as being working islands, and the term quite fits them, when compared with the usual type of South Sea island so attractive to the tourist. From time to time, however, some of our business friends are invited to take the trip as guests of the Commissioners, and everything possible is done to make such an occasion an enjoyable and interesting experience.

So starting off in the *Triona*, bound north, we speedily reach latitudes where the discarding of some of our surplus clothing is almost a daily occurrence, and the tropical white suits become very welcome. Nevertheless it is customary to go in for a vigorous course of deck games, not only by way of passing

the time, but also to keep fit for the strenuous rounds to be taken at the islands, where the mere fact of being close to the equator must not deter us from seeing everything there is to see. The nine or ten days aboard pass pleasantly enough; usually it is a fine weather trip, particularly after reaching the latitude of the trade winds. The monotony may be broken by passing in daylight close to some of the isolated islands near our route. Two of these, Matthew and Hunter islands, are uninhabited, desolate-looking places; the latter was fitly chosen by the South Sea writer, Louis Becke, in one of his island romances as being the place where a villainous marooning crime was perpetrated. Other islands which may be passed are Aneityum, Tucopia, and Cherry Island, much more interesting looking, and with rather a Robinson Crusoe aspect about them.

If our visitor finds himself humming:

> On the road to Mandalay
> Where the flying fishes play,

he will not be disappointed, at least so far as the flying fishes are concerned. As we reach the tropics, there will be shoals of little ones making short flights, looking like swarms of silvery butterflies. The larger ones in their haste to get out of the way of the strange marine monster that comes rushing along, make longer flights, frequently up to 200 or 250 yards. Different views exist as to the nature of their movements, and some say they merely spring out of the water and glide along. It is a genuine flight, however, and after close observation in both

calm and windy weather, in my opinion the construction of the modern monoplane comes much nearer to the flying fish than it does to any kind of bird. The two large wings function purely as planes, the propelling being done by a pair of small ones behind and lower down, and these move like lightning. In their position they get the benefit of any water dripping from the body of the fish, as of course the flying ceases when the wings dry.

First acquaintance with the flying fish is invariably found interesting, and a lady passenger on the *Triona* recently put her impressions into verse as follows:

Little bird
I have heard
  You're a fish—
That's absurd.

Though you fly
Not so high
  As a bird
In the sky,

Yet you skim like a swallow
With a quick darting motion
Through the blue waves' deep hollow,
And are lost in the ocean.

Flash of blue
Then it's true
  You're a fish—
Yes! I knew.

And God knew
You were you
  From the first;
So—*Adieu*!

When within 600 miles of Nauru and Ocean Island, wireless telephone communication is established; greetings are exchanged, and discussions take place as to the discharge of the inward cargo, the loading programme, etc., so everything is cut and dried before reaching our destination. Perhaps one of the lady passengers is informed that her husband on Nauru would like to speak to her. She goes along to the wireless-room and they have a chat. That it is in the Central Pacific seems hard to realize, and particularly so when on reaching Ocean Island, instead of the day-dream type of life usually associated with those climes, the visitor finds himself landed in a veritable hive of industry. Passing through Ooma settlement and half-way up the slope of the island, we are soon at the manager's house, where we are speedily made quite at home by Mr and Mrs Maynard. The view from the front veranda will be admired, with the two distant points of the bay to right and left, and the surf breaking on the reef. In the foreground below, the settlement is spread out, a tropical aspect being given by the numerous coco-nut palms and other attractive foliage alternating with the picturesque coral pinnacles. If in the early morning, there are sure to be some of the lovely little white terns darting about among the trees near by, and soon they will be bringing home tiny fish to their hungry offspring.

We take an early opportunity of going up to the Residency to pay our respects to His Honour the Resident Commissioner, and soon are deeply interested in hearing generally of the welfare of the

Gilbert and Ellice Islands Colony, which is under his charge. Though the Resident Commissioner is somewhat far removed from the other islands of this particularly isolated colony with its length of over 800 miles, he visits them in the little government yacht *Nimanoa*. Wireless communication with the administrative officers stationed at several stations in the two groups is of great assistance to him in dealing with the affairs of these primitive communities with their own particular problems.

Returning to Ooma, the lay-out of the Commission's settlement is soon noted. The offices, stores, workshops, power-house, locomotive-shed and condenser building extend along the waterfront, with the railway and miniature main road running parallel to this busy industrial section; where necessary, branch lines run inside the various stores, so that the truckloads of goods can be handled expeditiously. Somewhat farther inland the staff messrooms, kitchen, bakery, reading-room, billiard-room, and laboratory are located; behind this row there are several terraces of staff residences, extending well up the hill, while on the summit are situated the European, Chinese, Kanaka, and Banaban hospitals, in such a position that they get the full benefit of the prevailing winds. Farther along the main road, the lines of single men's quarters for the kanakas are situated, also extending to the high ground, while some distance on and at a higher level, Chinatown is located. The kanaka married men's quarters are laid out in several lines along the bay, parallel with the railway and main road. Somewhat

farther on we pass the L.M.S. Mission, and enter Tapiang village. There the government offices and the schools are located, and up the hill behind, the police lines are well placed. On the edge of the tableland a good open area is utilized as the government drill and sports ground, while beyond this the Residency is picturesquely situated. The other official Residences are dotted along a terrace at a good elevation somewhat beyond Tapiang.

The railway and main road run on to Tapiwa settlement and native village; at the former a number of our married staff reside under pleasant if somewhat isolated conditions. Communication is, however, quite good, as the Commission runs a little motor train service to timetable; this is free to European residents and is also useful in connection with the operations generally. The main road passes through Tapiwa native village at the far end of which is the Roman Catholic Mission, and then turns up the slope of the hill past the government wireless station. Sweeping round, it comes back through the inland native village of Puakonikai past our hospitals and down the slope to the main road at the settlement.

Starting out on our round of inspection, we look in at the Commission's general office, with the accountant's department occupying the ground floor, and accommodation for the manager, engineering and marine departments upstairs, all very convenient and suitable for the climate. The harbour master runs up his flag signals to the shipping from the balcony, the flagstaff being placed close by. We find

the various stores quite interesting and even impressive, for an enormous range of goods has to be stocked in view of the isolation of the island. The provisions section carries large and varied supplies for the three nationalities comprising the community; the trading division has all sorts of trade lines, particularly for the Gilbertese who count on spending some of their earnings at the store. The hardware, electrical and mechanical spares, and ship chandlery stocks are necessarily very extensive. As the sailors say, anything from a needle to an anchor is to be had, and the storekeepers with their native assistants make a point of having everything immediately available for quick service.

The machine shop with its wide range of mechanical tools and the adjoining foundry form a serviceable unit, and it seems as if anything in the way of metal work and mechanical repairs, including castings of course, can be done there; the electrical section is equally efficient. The wood-working shops with circular and band saws, together with other carpentering equipment, are all inspected with interest. In each section of the industry white men are in charge with trained Chinese assistants. The refrigerating plant is found to be working well, and the adjoining soda-water section turns out this useful beverage for the European community at a nominal cost. The basket shed is of interest; cane is imported from Hong Kong by the ton, and two or three Chinese are continually employed making and stropping large baskets capable of holding 15 hundredweight of phosphate, and which of course get very rough

usage during shipping operations. The Chinaman squats in the basket during construction, cleverly building it up round himself. We tell the leading man he "too much savvy," and he informs us with a smile that he has been ten years on the island. The condenser building is impressive, for in the event of a prolonged drought such as Ocean Island is famous for, the equipment, which is of the most modern type, must keep the whole community supplied with fresh water. The power-house with its row of Diesel engines used for generating electricity is inspected, everything is spick and span, and obviously this vital section of the island equipment is well cared for. After going thus far we realize that a continual bath of perspiration necessitates something in the way of replacement, and return to the manager's house for cool refreshments.

Starting out again we note the trim and comfortable appearance of the staff houses. Every man has his own home and they compare favourably with such buildings in the tropics elsewhere. Each one is fitted with shower-bath arrangements, electric light is installed and all are connected with the sewerage system. Dotted about the terraces the gorgeous flamboyant trees, numerous gay hibiscus, croton, and other bright leafed shrubs give a pleasing effect, quite the opposite to the usual conception of a phosphate island. The mess-rooms for the single men, with the adjoining kitchen and bakery stand close inspection; this department is under a white steward, with Chinese cooks and waiters. We pass through the rows of single kanaka quarters, all well

Photo: A. P. Lloyd

NAURU CANTILEVER: M.V. *GLENBANK* LOADING

ventilated and sanitary, with arrangements for sea-water shower-baths and connected up with the sewerage system. Chinatown too is similarly provided for; in its centre is a capacious recreation hall with a stage at one end where the very active Chinese club gives theatrical performances lasting interminably, to the twanging accompaniment of their one-stringed fiddles and the clanging of gongs. Their national flag is flown on Sundays and holidays, and they have their reading-room with Chinese magazines and papers by means of which they keep themselves posted as to current events.

During the recent complications between the Japanese and the Chinese a Japanese vessel arrived to load phosphate, and the crew was not supposed to come ashore, in view of the strong feeling among the Chinese. About half a dozen did so, however, including a petty officer, and walking up the incline from the landing jetty they suddenly came face to face with a number of labourers discharging some trucks. What happened? The petty officer said something sharply in Japanese, they lined up, took off their hats, and bowed profoundly. The Chinese hesitated a moment and seemed rather taken aback, but off came their hats, and they too bowed. *East is East and West is West*, and in the matter of politeness they can teach us some lessons.

The phosphate workings call for a prompt visit in view of their primary importance, for the material obtained there has to pay for everything. As we pass inland along the main road in the direction, strangely enough, of my first prospecting trip in

1900, a brisk walk soon takes us to the principal workings near the centre of the tableland. There we find several hundred Gilbertese at work along the face, as the phosphate bank, which is about 20 to 30 feet in height, is called. They are breaking up the rock phosphate, loosening up the finer material with picks and mattocks and loading the trucks; each man has a given number to fill, and when this is done, usually early in the afternoon, he either knocks off work, or else can load up some overtime cars for which he gets extra payment. The loaded trucks holding about one ton, are pushed out to the circular railway, and busy little locomotives, of which there are five on the tableland, run the rakes along to the elevated trestle-work above the dryers, where they are discharged into the wet bin. Kanakas drive the locomotives, and quite fancy themselves when placed in charge after serving satisfactorily as firemen. Another gang will be working the newly erected cableway as previously described, and before long there will be a second of these useful and labour-saving arrangements.

In addition to these loading gangs, there will be a number of kanakas at work with hand rock drills, and perhaps several mechanical drills worked by compressed air, putting holes in the larger masses of rock phosphate for blasting. The explosives are handled either by the white overseers, or else by some of the more responsible kanakas who have to pass a practical examination before they are given an official licence for such work. Another small gang under a European platelayer will be employed

extending the tramlines to follow up the phosphate face; in doing this a great deal of coral limestone blasting is necessary. The rock thus excavated is trucked away to a crushing plant in the vicinity, and after being suitably pulverized and graded, it forms excellent material for the extensive concrete work continually going on. The field operations all run smoothly enough, under the control of the civil engineering department which includes several white overseers.

As we move about among the coral limestone rocks and pinnacles with the sun pelting down, we experience the full meaning of the expressive phrase, "getting into a real good sweat." The perspiration simply pours out of one, but no harm is done thereby, and possibly the visitor may get some benefit physically from this species of Turkish bath.

From the time the phosphate is dumped into the wet bins its next stage is under the operations of the mechanical and electrical engineering department; it travels down the slope of the hill to the main storage bin, being crushed and dried *en route* by No. 4 unit as previously described. Then, if loading operations are going on, it is taken by a quick travelling rubber belt conveyor to the two hoppers at the end of the jetty where the marine department takes charge of its transport to the vessel. One can stand by the hour at the jetty end, watching the animated scene there; the five or six speedy launches are always on the move towing the fifteen or more surf-boats to and from the vessel. On approaching the jetty each boat is steered under

one of the shoots leading down from the hoppers. Then comes a minute or two of very dusty and vigorous exertion for the boatmen in keeping it in position while the phosphate rushes down the shoot. Each basket is filled in rotation, then a tow line is thrown to the boat from the next launch and off they go to the vessel. The operations run very smoothly in fine weather, and no time is wasted if 2500 tons are to be shipped in the two shifts for the day; if there is rough sea or surf to contend with, the boatmen have a strenuous time and few would envy them their job.

The most difficult part of the marine department duties, however, is not so spectacular as the shipping operations. It consists in maintaining the moorings in the best possible condition of safety for vessels to lie at them. But if through force of adverse weather, the worst happens and the moorings are carried away, the marine department knows no rest until they are re-laid and shipping operations can be resumed. During bad weather, therefore, when the bay is like a boiling pot, many are the anxious glances we give at the two main buoys in particular. Are they in their usual positions? Is their degree of floatation about right? Are the fenders still there?

Farther along the bay towards the middle of the settlement there is an older steel jetty, once a busy shipping centre, but now doing duty entirely for landing cargo, and the short jetty at the boat harbour is also used for the same purpose. The latter jetty is being rebuilt at present and other improvements are being made; we inspect the progress of these

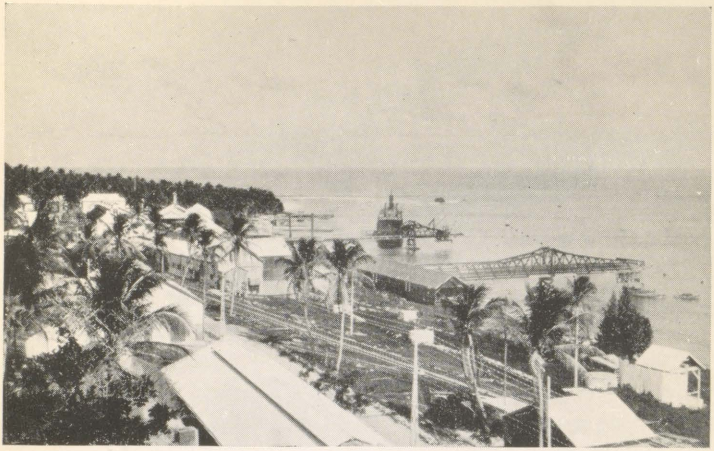


Photo: H. Gaze

HOME BAY, OCEAN ISLAND: LOOKING SOUTH-EAST

Photo: H. Gaze

HOME BAY, OCEAN ISLAND: LOOKING NORTH-WEST

with much interest, and when the boat harbour also is completed, the position will be much easier, in fact many of the difficulties always associated with the Ocean Island reef should be minimized. A few yards inland from the inner wall of the boat harbour the launch and boat sheds are situated, with skids, electric winches and other facilities installed for putting the boats in the water, or hauling them up promptly. This too is a busy place, for there are 11 launches and 35 surf-boats to keep in order, and there may also be one or two new ones in course of construction. Six or seven Chinese boat carpenters are employed at this work under the supervision of the civil engineering department.

Leaving the waterfront, we go up the hill to the hospital grounds, and are glad to go round the various buildings; also to find that the two doctors, the matron, and the dispenser are pleased with the arrangements generally. To our non-professional eyes they certainly seem to be all that can be desired. From this centre the health of the whole community is cared for, and the senior doctor holds the position of health officer. A considerable amount of laboratory research work is also undertaken in connection with certain tropical diseases, principally dysentery, filaria and hookworm. The newly installed X-ray plant is proving most useful, and the various photographs we are shown are of deep interest.

We call in at the analytical laboratory, a very serviceable and suitable outfit; daily analyses of phosphate shipments have to be made, and when necessary, various tests in connection with the fresh

water-supply, and foods, are conducted by the analytical chemist. He is the one member of the staff who constitutes a separate department.

Returning from a visit to Tapiwa by the motor train, a trip which is always enjoyable by reason of the picturesque and varied scenery, together with the good cooling down one experiences in the breeze, we get off at Tapiang and walk back through the long lines of kanaka married quarters. These are constructed as nearly as possible to the build of the native huts in the Gilberts, though of more permanent nature of course. The eagerness of the women to come to the island with their husbands is good testimony to the suitability of the arrangements for their welfare, and the large numbers of little brown kiddies are obviously healthy.

So our round of inspection on Ocean Island comes to an end. It has dealt with an industry, not perhaps of very great magnitude as compared with some of the world's vast commercial organizations, but having many unique features. Difficulties have been overcome, and others have to be faced from time to time, which are quite out of the ordinary, calling for the exercise of much resource. It is one thing to carry on work of this nature on the mainland of a country, but a very different thing to do so on a little rock-bound island in the middle of the vast Pacific Ocean.

CHAPTER XXII

A ROUND OF INSPECTION AT NAURU

When visiting the islands, we usually go to Ocean Island first as fitting in best with the vessel's itinerary, and it seems appropriate to do so, as the developments there are on a smaller scale than at Nauru. This is not owing to less enterprise having been displayed at the former island, but Nauru being a larger place, with much greater deposits of phosphate and possessed of many natural advantages, should rightly be the scene of more extensive exploitation. So we set out from Ocean Island late in the afternoon and are prepared for a hot trip, as steaming west means running away from the trade-winds. I recall a trip once in company with the General Manager when the captain of the tramp vessel we were travelling by insisted on giving me his cabin with its soft feather bed, a species of torture in the tropics to all but a salamander. Another unique feature on that occasion was that most of the bridge deck was turned into a flourishing fowl-yard, and we were awakened in the morning by a rooster crowing vigorously a few feet away. Whenever a hen cackled, one of the officers would go for the egg so promptly that we suspected some of the deck hands also collected them at times. However, we

had a good breakfast of bacon and eggs that morning, fare which one does not often get on a tramp vessel, so the fowl-yard went up in our estimation forthwith.

Nowadays the trip across on the *Triona* is more comfortable, though probably less eventful; the strong equatorial current, running two knots or more, helps us on, and arriving at Nauru early next morning we are soon boarded by the health officer and the customs official. The formalities are promptly put through, and our manager, Mr Christian, with several of the senior staff, comes aboard shortly after to welcome us. A launch tows the whale-boat to the boat harbour where the landing of passengers can be effected very comfortably under normal weather conditions. A few hundred yards' walk along the waterfront and we reach Stanmore House, the manager's residence, where we are very hospitably received by Mrs Christian.

These occasions are important ones, for when the General Manager, Mr A. Harold Gaze, visits the islands, a conference of the island managers and heads of departments at both places is held at Nauru. We all get together round a big table, with the General Manager in the chair, and the various details of the business as concerns island developments and the shipping programme are discussed. Any existing problems are tackled with such keenness and efficiency that a satisfactory solution is sure to be found; various important decisions are arrived at regarding the future, subject to the Commissioners' approval where necessary, of course. These con-

ferences are also conducive towards efficient team work not only at each island, but also as regards both places working together for the general welfare of the business. The wireless telephones are very helpful in this respect, the two managers conferring daily, either personally or through their respective clerks, and the degree of co-operation now existing is highly satisfactory.

One of the first visits we pay after our arrival is to His Honour the Administrator, Commander R. C. Garsia, and though his charge is one of the smallest of the mandated territories, it is certainly not least in commercial importance. The good people who arranged the mandatory system would surely be gratified to see the amount of careful thought given to the welfare of the native population, and we are much impressed subsequently on seeing something of the improvements that have been introduced. As we motor to and from the Residency in the manager's fast car, one cannot but reflect on the different conditions which existed on the occasion of my first visit to the official headquarters on Nauru in the year 1900.

The Commission's settlement, in the district known as Yangor, has the great advantage of being situated on the flat coastal belt. This particularly facilitates the arrangements for the stores, power-house, workshops, and the labourers' quarters, or Chinatown, as it is called. All goods and other cargo brought ashore either at the boat harbour or the landing jetty are trucked direct to their destinations without having to be hauled up an inclined railway as at

Ocean Island. The flat land also permits of a very good lay-out of the settlement. Taking the boat harbour and the adjoining landing jetty as the centre, and turning to the south along the waterfront, we pass the extensive marine gear store, and the boat and launch shed which is fitted with suitable skids running down to the boat harbour. Then we come to the single staff mess-rooms and kitchen, the billiard-room, laboratory, general office, and a row of senior staff houses, with Stanmore House at the end. Several rows of staff houses parallel with this first row are conveniently situated a little farther inland, the main road passing through Yangor being within easy reach. This residential area is the scenic part of our settlement. Tall coco-nut palms and other trees are dotted about here and there, and the numerous hibiscus and bright leafed shrubs, together with the straight even paths, give a very pleasing effect. If early morning when we stroll through, it is quite likely that any Australians in our party will be pleasantly reminded of home by the typical notes of the kookaburra, more commonly known as the laughing jackass; these birds appear to be quite happy under the tropical conditions and announce the fact by their mirthful note. We are sure to see some of the graceful little *itirir*, or Nauru canaries as they are called, flitting about, and very charming they are with their pretty song, frequently tuning-up on moonlight nights; so far the kookaburras do not appear to be molesting them, apparently preferring to live on the numerous lizards to be found in the treetops.

Passing farther along the waterfront we come to the steel jetty, now quite superseded by the cantilever, which is situated some 300 yards farther to the southward. The fuel oil storage tanks are to be built in this vicinity, near the boundary of our settlement.

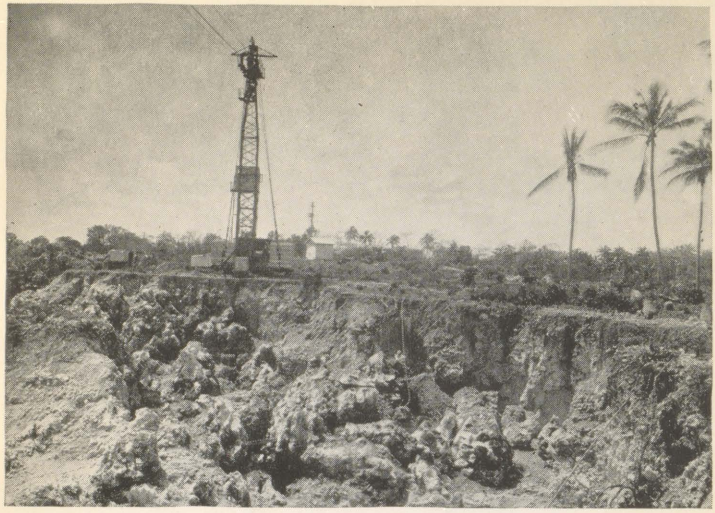
Turning to the north from the landing jetty, we pass the condenser house, the machine shop, and the foundry, places where a lot of interesting work can be seen going on. The boundary of Chinatown is close by, extending a considerable distance along the coast with ample provision for kitchens, bath-houses, recreation and reading-rooms. Many of the dwelling houses have been rebuilt lately, and are very suitable for their purpose. This part of the settlement, with its neat and methodical lay-out, even picturesque in places, is always found interesting by visitors. Somewhat inland the Chinese keep a number of pigs in enclosures, for if there is one form of diet that appeals to John Chinaman more than another it is pork, and his appetite for it appears insatiable.

This led to numerous offences, particularly in earlier years, for they could not resist temptation when seeing the Nauruans' pigs running about in such numbers. One of their traps was a cement cask on its side containing a little cooked rice as an attractive bait for the hungry pig. The watchful Chinaman would then dart out and make off with the cask and the pig inside, too surprised to squeal. Another dodge was a larger cask with the bottom knocked out, lying on the sand with some rice in it.

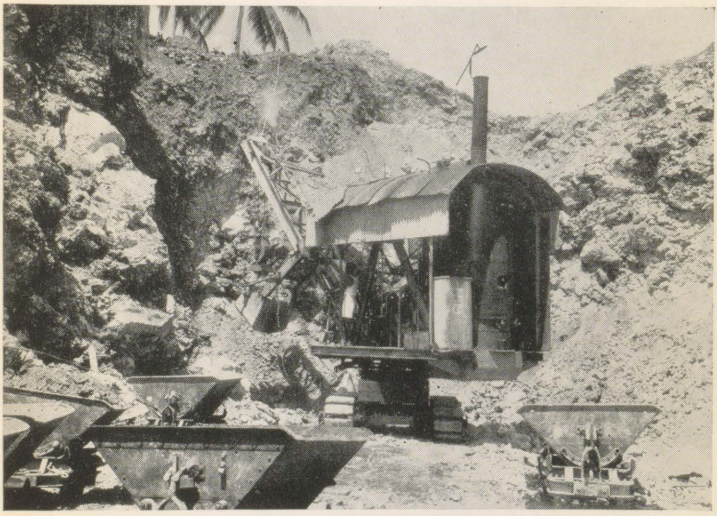
When the pig was inside, the man would run out and upend the cask; the animal rising on its hind legs to get out would sink in the sand and remain hopelessly bogged until nightfall. On these occasions, the proximity of the native police had to be carefully studied, for such thieving was rather severely dealt with.

The greatest *coup* in the way of pig rustling was at the expense of the Commission some years ago when a former manager started a pig farm as a promising adjunct to the fresh meat supply. Some well-bred pigs were imported, a good yard was made, and a Chinaman was placed in charge. There was ample food in the way of coco-nuts, etc., and the pigs flourished, numbering thirty-five before long, but one night they all disappeared as completely as if the ground had opened up and swallowed them. The police guard-room was less than a hundred yards away, but ne'er a grunt nor a squeal was heard; the Chinese caretaker, when questioned in the morning, simply replied "no savvy," and that was all. It is said that the manager, who is now in a responsible position with us elsewhere, still meditates in his spare time as to how they beat him for those pigs.

Returning to the landing jetty, we follow the main railway for two hundred yards or so leading directly inland; in this area the various stores are conveniently situated, some of them with branch lines running inside for convenient trucking. Large and varied stocks are held here, as at Ocean Island, and the same efficient methods of arranging



MINING PHOSPHATE AT OCEAN ISLAND: BY ELECTRIC CABLEWAY



MINING PHOSPHATE AT OCEAN ISLAND: BY STEAM SHOVEL

the goods are noticeable. The power-house is adjacent, and the row of Diesel engines is impressive. As all the machinery on the island, including the cantilever and the cableways, is electrically operated, the consumption of power is necessarily heavy. The latest engines are wonderfully efficient; they need most careful attention, and they get it.

Adjoining this building there is a series of large concrete cisterns which serve for holding and to some extent cooling the sea water used for circulating through the Diesel engine water jackets. A problem has been solved in a somewhat unique way in these cisterns. Formerly they developed such a vigorous growth of marine grass that it was necessary to clean them out periodically, entailing a good deal of extra work and inconvenience. Then it was noticed that one of the cisterns was keeping free of grass, and on close examination, a number of tiny fish were seen nibbling at the stumps of the weed. They had obviously been drawn up from the reef when pumping was going on, having ventured too close to the suction pipe. It was decided at once to increase their number, and further supplies of several kinds were netted on the reef; they were transferred to the cisterns with most satisfactory results, the marine grass not causing any further trouble. The mechanical and electrical engineering department does not overlook much, and even the little fish on the reef are brought into service.

Farther on, the railway connects up with the coral rock quarry on one side, and with the phosphate bins on the other. Formerly dry phosphate was

taken from the bins to the jetties in 1-ton trucks hauled by electric locomotives, but now rubber belt conveyors do practically all the work of transporting phosphate from the large storage bins to the cantilever shore bin. It seems as if almost wherever one goes in this locality, there are rubber belts hurrying along with their loads in the direction of the insatiable cantilever. They stand up to the strenuous work remarkably well, and we were informed that one had exceeded its estimated carrying capacity, having conveyed over 1,000,000 tons without being worn out.

Almost in the middle of the northern half of the settlement a picturesquely situated large open space is utilized as a cricket pitch, a sports ground and a nine-hole golf course. Such spaces on the coastal belt are somewhat difficult to obtain, as it is all coco-nut land, so the most has to be made of this area. It serves quite well for the first two purposes, and as a golf course is a distinct success, even though some of the features are novel; for instance, the greens are formed by rolling in a layer of fine phosphate, then sprinkling a little loose coral sand on the surface. Quite a good putting green is thus obtained, without requiring the use of fresh water, which would not be available in sufficient quantity even if fine grass would grow. The fairways have a fairly good growth of coarse grass, and the coco-nut trees surrounding the area, with bunkers suitably placed, form all that is needed in the way of hazards.

The phosphate workings at Nauru are inspected under relatively comfortable conditions, assuming

that a very detailed examination is not desired. We are motored along the main road for a mile or so to the south, then we strike inland to the railway, where a little locomotive and a passenger car are awaiting us. We are soon dashing along through the coral pinnacles, at times so close to them that our knees seem in danger. Here and there we are side tracked to let a locomotive with a rake of loaded trucks pass; there is a good deal of shrill whistling and strange Chinese exclamations, but it works out quite well, and the extensive length of the phosphate workings is thus visited. We see the six cableways busily engaged filling up the rakes of trucks, and it is quite absorbing watching the adroit manner in which the labourers fill the 25-hundredweight skips, almost juggling the phosphate in. The loose friable nature of the Nauru deposit facilitates this operation a great deal, particularly as there is a minimum of phosphate rock compared with the Ocean deposit. If any of our party are looking for a thrill, they can have it there and then; one of the cableway skips will be lowered, and with seven or eight people aboard it is quickly hoisted up to the wire hawser swaying overhead. A movement of the flag from the signal man and the carrier with the skip is run along to the opposite tower and back at a great rate; a unique view of the coral pinnacles with the Chinese at work in the deep excavations is thus obtained, likewise the thrill.

In another part of the workings there are two mechanical "shovel loaders" at work, using a five-hundredweight scoop with almost human ingenuity,

and throwing the phosphate into trucks; their small size and compact structure enable them to work among the pinnacles in a manner that would be impossible for the ordinary steam shovel. The cableways and these shovel loaders have made things very much easier for the labourers; previously they had to load the trucks with baskets and carry-poles in regular Chinese fashion, but it was strenuous work in the tropics and no people are more appreciative of considerate treatment than the Chinese. The rakes of loaded trucks are dumped in the wet bin and the phosphate travels down from the high level to the storage bins on the coastal belt, meanwhile passing through the crushers and the mechanical dryers as previously described. Before leaving the locality of the workings, we note the numerous little plots of Chinese gardens about the outer edges. They raise quite a lot of vegetables on both islands in their own peculiar but effective way with benefit to their health, besides keeping their hands in at China's age-long occupation. Again the little locomotive and the passenger car whiz us along through the pinnacles, and getting out near the hospital we thank the civil engineer and the two or three Europeans for their good care of us on "Topside." That is what the Chinese first termed the phosphate workings by reason of their elevation, and the name is now generally adopted.

Next the doctor shows us over the hospital, which is situated in a fine position approaching the edge of the elevated land and looking seaward across a dense growth of coco-nut palms. The wards, operat-

DEEP-LEVEL PHOSPHATE WORKINGS, CENTRAL AREA, OCEAN ISLAND
(Worked by cableway.)

ing-room, and dispensary are all well-appointed and nicely kept. As at Ocean Island a good deal of research work is going on, and again we look through a number of X-ray films, good evidence of the use being made of the apparatus. The medical staff includes a matron and a dispenser; the orderlies are Chinese, but a very noticeable feature is that there are so few people about, either patients or attendants. The Chinese on both islands have particularly good health now that the dread disease of former years, *beri-beri*, has been overcome. When an epidemic of influenzal colds reaches the islands, the first to be affected are the kanakas and natives in great numbers; then a proportion of the Europeans go down with it, and last of all, perhaps just a few of the Chinese; tough old John Chinaman stands up to such troubles better than any of us.

Early next morning, perhaps, an 8000-ton steamer arrives; there is no inward cargo to discharge and she is all ready for loading at the cantilever, so a prompt start is made at hauling her into the loading position. Soon the giant arms of the structure swing toward the vessel, a sign that she is all ready; the extension booms are run out, and shortly after a cloud of phosphate dust denotes that loading has commenced. The mechanical and electrical engineer takes us over the plant, and as we see his watchful assistants stationed at the various points, we realize and appreciate the careful attention that is given to every detail of the elaborate mechanism. We pass along one of the extension booms and look down on the big vessel underneath, slowly settling deeper as the

phosphate streams into her holds at the rate of 1000 tons per hour. The mooring gang from the shore are sitting about on deck smoking their pipes and taking it easy, but available in case of any emergency. The harbour master is near by, giving an occasional glance at the weather from force of habit, but the light clouds are coming away nicely from over the land and he knows that all's well. Late in the afternoon we stroll round to see how the work is going; we find that the steamer has just finished loading, and is hauling off to the outer buoy. The cantilever arms are slowly turning in over the reef for mooring to their respective towers. Half an hour later, the deeply-laden vessel is disappearing in the distance, and we reflect with satisfaction that another cargo is being carried south to help on the great scheme of things whereby mankind shall have its daily bread.

CHAPTER XXIII

EVERYDAY LIFE AT NAURU AND OCEAN ISLAND

People of British stock seem to have the right temperament for settling down and making themselves at home in the distant and lonely places of the earth, a faculty which has probably counted for a great deal in the development of the Empire. In this connection, few parts of His Majesty's wide spread dominions are so far removed as Ocean Island, or so tiny in area; none of the other mandated territories can compete with Nauru in the matter of splendid isolation. Situated within a few miles of the equator as they are, the heat is even a more trying feature than being so cut off from the outside world. How are things with the little communities on the two islands? Are the residents able to overcome the obvious drawbacks and hardships of the life, and adapt themselves to circumstances, or is it a case of going there to save a little money and then leaving for more propitious lands?

There can be no doubt the island life has an indefinable charm of its own, and does actually appeal to most people. Occasionally we find men and women who are temperamentally unfitted for the conditions; the isolation or the climate seems to get

on their nerves, and in such case the sooner they are away the better for all concerned. In small communities one or two who are disgruntled can be a very disturbing element. To many who visit the two islands, the life there seems like being in a different world, one where unemployment with its attendant ills is never mentioned; in fact does not exist, for all who desire work can obtain it. The world-wide depression is rarely referred to, probably through being so far removed from both places. We get out of the way of carrying money about, and find it much more convenient for store purchases to be charged up; the natives are not looking for tips, so money in one's pocket is really superfluous, and may be lost during the frequent changes of our tropical suits. The daily newspaper is not only unavailable, but strange to say, is not missed; this surely is proof of being in a different world. One is frequently nonplussed on returning to civilization to have to plead ignorance about events which happened some time previously and did not appear in the brief wireless bulletins issued on the islands.

The members of the island staffs seem to fill their time very well; their duties keep them going during the day, and altogether they have quite a busy life. For their leisure hours there is a good variety of recreation; sea-bathing, cricket, football, tennis, and golf are all popular. With such vigorous games in that climate, there is of course a profuse amount of perspiration, but those who go in for the active life are the ones who stand the heat best.

The usual term of service for Europeans in the

Commission's employ is two years, and an agreement is entered into for that period. At the end of it, assuming that the arrangement has been mutually satisfactory, a three months' vacation on full pay is taken in Australia or New Zealand, with a free passage each way of course, and then a further agreement is entered into. If a trip to the Old Country is desired, extended leave is obtained. Naturally the holiday in the cooler climate is keenly looked forward to, and is very beneficial from a health point of view, besides having a good effect on the outlook generally. Under this system, vacancies on the staff very seldom occur, which is good evidence that the service is popular. They say facetiously that the first six years are the worst, and there certainly seems to be something in it, for those who put in that period usually stay much longer. Usually the European staff on each island numbers just over seventy, about half of them being married men, and having their wives and younger children with them.

What sort of life is it for the women, and what constitutes the day's routine? How do they occupy their spare time? It is probable that they feel the heat more than the men, and their health perhaps is not so good; this, however, is frequently the case in tropical countries. Nevertheless they take to the life very well, and make light of the various drawbacks with the usual pluck we associate with our womenfolk; many of them remain the full two years with their husbands, others go south somewhat earlier. What may be called the seamy side of mar-

ried life at the islands is the fact that children should not be there after the age of eight to ten years. They grow too quickly and become like hot-house plants. The separations thus entailed are very trying, and there seems no way of getting over the difficulty. There are schools for the white children at each island, with a European master, and off they go daily with their books and bags much the same as in civilization. After school-hours they revel in the sea-bathing, and up to the ages mentioned are probably as strong and healthy as children elsewhere, thoroughly enjoying the island life.

In order to ascertain the women's point of view, I made a few tactful inquiries recently regarding the spending of their leisure time, the usual topics of conversation when paying calls, and so forth. The result may be mentioned here as having a bearing on their daily life. Household duties in the morning naturally call for the usual attention, sometimes relieved by a visit to the store to do a little shopping, perhaps to see some of the latest things which have just been unpacked. In the afternoon, "Tea and Bridge" or "Tea and Tennis" are popular; we find that outdoor games are equally healthy for both sexes in the tropics. At Nauru a round of golf or a spin in the car have attractions, while at Ocean Island the railway trip to the other side of the island and afternoon tea with friends there pleasantly breaks the monotony. Quite a good deal is done in the way of social calls; on such occasions the most frequent topics of conversation, so I was credibly informed, are, first, the local chit-chat, the social and

personal pars so to say. Next in order of importance are the vagaries, delinquencies, and qualifications of their native or Chinese houseboys; then there are the experiences with their gardens and fowl-yards, and lastly there comes the exchanging of information on the subject of recipes.

The kanaka houseboys at Ocean Island are a great asset in this connection, they are so unusual and so delightfully irresponsible, but at the same time eager to do their best and to please their mistresses. There seems to be an appropriate local atmosphere about them which makes up for a lot of shortcomings as compared with the almost mechanical efficiency of the Chinese servants. It is related that recently the matron was receiving a special visitor, when suddenly her houseboy appeared and inquired: "*Tera te buren n te bong aei?*" "What's the pudding today?" The matron shooed him out, and when he was clearing away the breakfast things next morning, he was duly taken to task about his untimely question. Atuera looked grave and expressed his regret; he did not mean anything disrespectful; but after all, was his mistress not letting things assume the wrong perspective compared with the stern realities of life. "What does it matter?" he asked, "We will all soon be dead, just like that." He took an egg-shell from the breakfast-table and crunched it up to demonstrate his point. As a cook, however, Atuera is a distinct success, and his celebrated "gems" are gems indeed. When fish are required too, he gets them in a way that few cooks or houseboys could emulate. Taking a pair of special tight fitting gog-

gles and a long spear, he wades out over the reef, dives into deep water and has a fish on the spear almost each time he comes to the surface.

The native washerwomen are always referred to as "Janes," not from any special suitability for that once old-fashioned name, recently become popular, but the Banaban and Gilbertese word for woman is *Te Aine*, pronounced so like "Jane," that the adoption of the latter has naturally come about. So if visitors to the island hear their hostess remark that she is fortunate in having a good Jane, they will know what is meant.

Some surprise may be felt that gardens and fowl-yards should come into the conversational category, but they count for a good deal at the islands. Each home is beautified with a little garden and a number of pot plants on the veranda; in drought times these require a very great deal of care and attention to keep them alive. The verandas are important features of each home; they are extended considerably on the cool side of the house, and dining and entertaining are done there rather than indoors, with a very pleasing effect. As to the fowl-yard, well, eggs are eggs in the tropics, particularly if you know they are fresh. Purchasing them from the natives is risky. On one occasion the storekeeper had bought some from a native boy in the evening, leaving them on the counter. Next morning on going to the store, several wee chicks were wandering about, calling for food. The warm night had hatched them out.

As for recipes being an item of frequent conversation and exchange of views, it is obvious that a

desire for good housekeeping is as characteristic on the islands as with all our womenfolk, and the standard reached in that direction is quite a high one.

One of the features that lady visitors in particular have expressed great surprise and admiration at, is the wonderfully good way in which things are done, in the event of some special function such as a luncheon, dinner-party, reception or dance. Whether at the Residency of either island, or at the managers' houses, the measure of success is remarkable, and one almost needs the distant murmur of the surf on the reef or the rustle of the coco-nut leaves, to realize that it is actually the Islands. The effect is increased by the pleasing introduction of local colour, as for instance when the guests are decorated with garlands of flowers brought in by some of the native belles. Or a humorous touch may be given by hearing one of the strapping native police who assist for the special occasion, say to the others in Gilbertese:

"Hurry up; can't you see they are all waiting!"

Motor cars are a great asset on Nauru, both for purposes of recreation and for quick moving about the island; a run round the coastal belt to the eastern side in the cool of the evening, or on a moonlight night, returning perhaps by way of the picturesque Bruce Highway leading through the interior, is always a pleasurable experience. Some of the staff take their cars south when going on vacation, adding materially to the pleasure of their holiday. Ocean Island was always considered too rough and steep for motor traffic and the roads too narrow, but during the last year the manager has been supplied with a

little Austin tourer, and it is proving an immense success. Visits to the government office or to the Residency are much simplified, and an evening run along the seven miles of available road is a great treat after the heat of the day. The little car has the distinction of being the only one in the Gilbert and Ellice Islands Colony, and incidentally is the only car in the wide world running on a road composed entirely of the highest grade phosphate.

Another useful diversion at Ocean Island is the custom on the part of some of the staff to have small camps on the rugged northern and eastern sides of the island; they are located just above the rough limestone coast-line, and usually close to a tiny coral sand and shingle beach, suitable for bathing. Here the owners and their friends can relax and rusticate in their spare hours "far from the madding crowd," and forget for a time the busy life of the settlement. Visitors to the island all take away pleasant memories of "Maynard's Camp" and the picnics or afternoon-teas held there; the picturesque rocks in the foreground, the white coral beach with the surf breaking on the reef, and the blue waters of the Pacific beyond. Sitting there looking across the wide expanse of ocean and watching the "white horses" merge into the line of breakers at the reef edge, one seems irresistibly drawn into reverie. All the surroundings conduce towards it, and apparently such feelings were not confined to our race, for only a few yards away on a jutting mass of rock, is a tiny platform composed of coral slabs, which was evidently a favourite spot with some old-time Banaban.

There he too would come to enjoy the cool breeze, and to meditate on the things of life as he knew them. Beyond the reef, the little white tern and the noddies are darting down after fish; a dark plumaged heron flaps slowly along the reef, and two man-of-war hawks soar aloft in their own inimitable way. A bright-eyed friendly little rock lizard suddenly appears near by, and looks curiously at us, as he basks in the sun. Yes, the place casts its spell, from which the element of romance is not lacking.

In addition to the large numbers of slender little rock lizards which visitors invariably find pleasing with their picturesque appearance and habits, there are the stouter built tree lizards, or geckoes as they are called. These are light yellow in colour and possessed of roguish ways; they must be the wags of the miniature reptile world and certainly wag their tails as if with that object in view. They cause quite a lot of amusement by their prowess at catching moths. On the veranda in the evening while lying back in an easy chair one can see the performance to good advantage. The moths attracted by the electric light buzz round in goodly numbers, and the geckoes stalk them with considerable cunning, their tails quivering with excitement as they get near enough to make a sudden pounce. Frequently they dodge out of the way in droll fashion if a large "toddy moth" comes buzzing along too close for their ideas of safety, these moths being much too big for them to tackle. As the gecko has to operate upside down, and he very rarely falls from the ceiling, his performance is somewhat remarkable. Nauru

has a third variety of lizard, quite black in colour and not attractive to look at; if the gecko is a wag, this other would be what the Scotch call a dour de'il.

Our people at the islands, with typically British mentality, give the matter of sport a great deal of attention, and it is well developed at both islands, pride of place no doubt being given to the golf course at Nauru which is becoming increasingly popular. Started only two years ago, the club has a membership of sixty-six, and forty-five associates, including the Administrator and most of his staff, who play regularly. Hitherto Ocean Island has been considered much too rough to lay down a course, but lately some enthusiasts, undeterred by the many natural hazards, and stimulated by the success of golfing at Nauru, have succeeded in laying down a few holes. Other sport activities are very well organized. Committees are set up controlling the cricket, football, and tennis; tournaments are arranged at regular intervals and matches between the various teams take place each week. Quite a high standard of play is reached, as teams from some of the visiting vessels have found. The tennis courts at both islands are electrically lit with powerful flood lights, and play can therefore be carried on in the evenings under comparatively cool conditions.

"The pictures" have for years been a useful source of entertainment for the island communities; recently "talkies" were introduced by the Commission with marked success, even though a good proportion of the audience, whether Chinese or kanaka, does not

understand English. At first some of the natives reacted to the screen in a strange way. One of the young Banabans, on seeing tragedy portrayed, was much upset, and next day informed the European he was working for, that the white people were dreadful; he had seen a man killed right there, and the Europeans present were all laughing. He had to be assured that a murder did not actually take place when the picture was prepared, but even then he was not pleased. If it wasn't real then the white men were *keve* (deceiving). They have, however, come to prefer pictures of the cowboy type with plenty of incident, which fortunately they do not set out to emulate.

The Chinese labourers have taken up sport a great deal of late years, particularly on Nauru; they obtained from the Nauruans the use of a vacant piece of ground, cleared and levelled it in their spare time, and now have football (soccer), basketball, and volley-ball contests regularly. Sometimes matches are played against the European or native teams, developing quite a head of excitement. The Chinese enlisted the active sympathy of the manager in this new development by suggesting to him, "with a smile that was childlike and bland," that it was "more better than gambling." A good deal of the latter goes on as well, of course, and a stroll through Chinatown on pay-night reveals quite a lot of high life. At the recreation hall a Chinese theatrical show will be in progress, near by there will be fan-tan and mah-jong in full swing, and in the vicinity numerous side stalls where all sorts of Oriental

dainties are for sale. Both the Nauruans and the Banabans trade regularly with the Chinese, selling them pigs, fish, fruit, and vegetables; business of this sort goes through quite satisfactorily, disputes rarely occurring. Apart from sport contests and small trading operations, the races do not mix freely in their ordinary life.

The customs of the Nauruans afford some strange contrasts to the modern developments on their island. For instance, a few yards distant from where a large steamer will be loading under the cantilever, a native will be fishing in his primitive outrigger canoe in just the same manner that his forefathers did. Or just along the beach a man will be feeding his collection of tame man-of-war hawks, throwing pieces of fish high up in the air for them to catch as they circle around in quite a spectacular manner. Close to our settlement with its comfortable bungalow type of houses, and the modern mechanical plant, there will be the primitive huts of the natives. Fortunately the Administration is encouraging the preservation of their old-time arts and crafts; this is particularly necessary in the case of the Nauruans, as they are not attracted by the white man's industries in the same way that the Banabans are. Nevertheless they fully appreciate such things as motor bicycles and some of the chiefs possess motor cars and lorries; their standard of living has naturally much improved, and European provisions are in considerable demand. Usually South Sea Islanders are very extravagant and spend everything they can lay their hands on. That is not the case with the

Nauruans, who are now encouraged by the authorities to bank a good deal of their money at the local branch of the Commonwealth Bank.

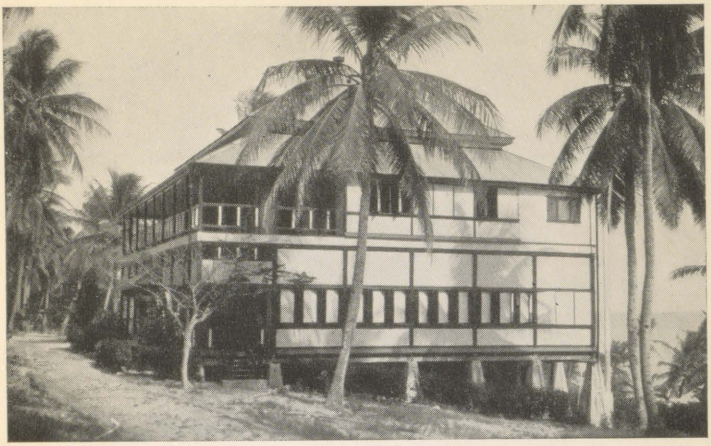
The progress made by the native children in the day schools indicates an unusually high order of intelligence; it is interesting also that they have a Boy Scouts troop, numbering forty, together with fifty Cubs, or boys under twelve. The young men of the island take much interest in the various sport activities and can fully hold their own in the competitions with the other clubs. That they have a sense of responsibility and capacity for training is instanced by the fact that the force of native constabulary employed in maintaining law and order is composed entirely of young Nauruans under an efficient white officer. In the earlier years under the other regime, this force was recruited in German New Guinea, involving a good deal of expense and accompanied by various disadvantages.

Quite a valuable asset to the social life of the community is the Nauruan brass band, under the baton of Mr J. Griffiths, of the Commission's staff; it has been running for a number of years, and the natives undoubtedly have a gift in the way of music. Some years ago, one of the mission choirs rendered selections from *The Messiah* at Christmas, and it is said that the performance was remarkably good.

Mention has already been made of early missionary work at Nauru. Following on the events of the Great War, the London Missionary Society took over the station, and the Rev. and Mrs Hannah have

been in charge for a number of years. They also have the oversight of the L.M.S. Mission on Ocean Island, paying occasional visits there. The principal native pastor is one of the two Nauruans who assisted Mr Delaporte in the translation of the Bible many years ago; the other who was engaged on this important work is now one of the leading chiefs. The Nauruans are staunch church people, and it is all very real to them. How deep does it go? some may ask.

Let me tell the story of my old friend Dekaroa —murderer, buffoon, penitent, who passed away not long since at a ripe age. Many years previously, he with several other Nauruans went off in their canoes and massacred a party of Gilbertese who had gone adrift from their islands and were approaching the south point of Nauru. In 1901, when several of us were the guests of the German magistrate for a few days, Dekaroa was employed by him as house-boy, and was sometimes called on by his master to act the tragic event he had been concerned in. He would go through it in pantomime, and certainly displayed unusual gifts in that direction for a native. When visiting Nauru in later years, I used to see the old man from time to time, and would exchange greetings with him. A few years ago we met in this way and, after the greetings, I made some light allusion to his early escapade, not in very good taste admittedly. Dekaroa looked serious; "Me too much shame belong that time," he said, "me no savvy no good do like that." And then partly in Gilbertese and partly in pidgin-English he told of



THE OFFICE, OOMA, OCEAN ISLAND

NATIVE LABOURERS AT MESS-ROOM, OOMA, OCEAN ISLAND

having come under the influence of the mission and of seeing the errors of his ways. He felt that he should, if possible, meet some of the relatives of the murdered Gilbertese and at least express his deep sorrow for what he had done. We had natives from the same island on Banaba, so Dekaroa wrote across to Eri, the leader of the *kaubure*, and explained the position. Eri replied, saying it would be safe for him to come, and also invited him to stay at his home while on Ocean Island. This was done, and the visit passed off very well, a reconciliation being effected with the Gilbertese; old Dekaroa had made amends in the only way possible.

Under the auspices of the Anglican Church, a chaplain pays an annual visit to both islands, particularly in connection with the European residents. His Lordship, the Bishop in Polynesia, took the trip recently, and was heartily welcomed by all.

The Sacred Heart Mission has a branch at Nauru as well as at Ocean Island, and Father Kayser, who has spent many years at Nauru, enjoys the respect of the community.

The passing of time and the altered conditions on Ocean Island have effected many changes among the Banabans, particularly in regard to the older people; those who were the principal men in the community on the occasion of my first visit in 1900 have nearly all passed away. One misses them and their hearty welcome when returning to the island from time to time. They were men of marked individuality, of undaunted and resolute character, a type doubtless developed by their strenuous life

and the struggle for existence in earlier years, but kindhearted and genial to a degree. Only recently our old friend Eri passed away, to the deep regret of many; the manager sent the British flag down to cover his coffin, a token of respect which his relatives much appreciated. What of the younger fellows who are coming on? Circumstances have been very different for them, and naturally they do not show in their faces the marks of the hard campaign. They are a fine type of native though, intelligent, manly, and athletic, some of them quite well educated, and able to hold their own generally.

As in early days, a large proportion of the Banabans continue in the employ of the Commission, and the young fellows, being always on the island, come in for what may be called the fancy jobs. We find them reliable and capable; they make excellent assistants in the various stores, and when the hundreds of Gilbertese are spending their earnings, the transactions at the counter are quite worth watching; interspersed with the rapid purchases are many humorous incidents. Several of the educated natives are employed in the accountant's office, using typewriters or adding-machines, also doing excellent pen-and-ink work. It is related that one of these, when being first taken on, was having his duties explained by a lady clerk, in more or less pidgin-English. She was somewhat taken aback by his replying with perfect pronunciation:

"I quite understand, madam."

Others of the young fellows are assistants to the

surveyor and in various positions of responsibility, which of course carry higher pay.

The way they meet any emergency which arises sometimes has quaint results. On one occasion I sent a chit to the doctor, reading like this:

DEAR DOCTOR,
Please give bearer some A.Ks [Anti-Kamnia] and oblige.
A.F.E.

It happened that the doctor was out, but in due course the messenger came back with the desired tabloids, and a note from the native orderly, as follows:

DEAR MR ELLIS,
I send the A.Ks, but we haven't got the other thing.

He had come to the conclusion that "oblige" was a drug not stocked.

As the Banabans are relatively so prosperous, a great deal of their phosphate money is set aside by the Government in order that it shall not be squandered, as is too often the case in the Pacific. Such problems as arise on the two islands from time to time, regarding the present and future welfare of their particularly interesting native inhabitants, are dealt with by those who have their real interests at heart, combined with extensive experience in such matters.

The modern conditions at Ocean Island are naturally having a pronounced effect on many of the primitive customs and early social arrangements of the Banabans. There is a danger that many of these may not only be abandoned but lost sight of once

and for all. This would be very regrettable in view of the considerable degree of unique culture developed by these people on their lonely and isolated island. Fortunately this interesting subject has been carefully investigated by one of the Colony officials, Mr H. E. Maude, who has written very ably on "The Social Organization of Banaba, or Ocean Island," in the *Journal of the Polynesian Society* (December 1932), and those of us who know the island hope that there will be more such articles to follow.

Apparently the remarkable prowess of the Banabans at surface fishing will be lost in the near future, as they have ceased to make the beautiful "five-man" canoes which were such a noticeable feature in earlier years. In these canoes they would go miles out to sea following the passing shoals of bonito, albacore, and other large surface fish, in the catching of which they excelled. How they managed to haul in swordfish and large sharks without capsizing their frail craft was always a marvel to me. This strenuous type of fishing has been displaced by line fishing comparatively close inshore, using small "one-man" canoes for the purpose. It is of course a natural development brought about by their not being so dependent on fishing as formerly.

ELECTRIC CRANE RAISING PHOSPHATE
FROM DEEP LEVELS, NAURU

AIR SHOVEL-LOADER, NAURU

CHAPTER XXIV

LABOUR RECRUITING—PAST AND PRESENT

An important phase of the operations at Nauru and Ocean Island is the recruiting of labourers. Usually two trips take place each year, the time-expired men being returned to their homes, and new men engaged. As regards the Chinese, the arrangements are carried out through experienced agents at Hong Kong, the recruits being carefully selected, and sent to the islands in a small steamer chartered for the purpose. After landing them, the men who have completed their term of service are taken aboard and returned to China. As a matter of fact quite a number of them elect to stay on for a further term. The employ is now well known to the Chinese, and there is no difficulty in getting a good class of labourers, and also trained assistants for the white mechanics. The work of labour-changing runs smoothly, and does not call for special description.

The recruiting of the Gilbertese is more picturesque, by reason of the unusual conditions at their islands, and the primitive habits of the natives. It need hardly be said that there is nothing in the way of "blackbirding," the term commonly applied to early Pacific methods of securing kanaka labour. The tricks, and even criminal methods too frequently

employed in bygone days for that class of recruiting, were not conducive towards making service with the white man popular. Nevertheless, we have plenty of incident on the labour-changing trips, and it may be of interest to describe the procedure, and to recall some of my earlier experiences.

The recruiting officer who goes in charge of the trip is accompanied by one of the doctors to examine the recruits, a clerk to assist in the various details of the voyage, such as issuing rations, and an engineer in charge of the two launches and six surf-boats which are used for the operations. The licence to recruit is obtained from the government office, and with the time-expired men aboard, their wives and children, and hundreds if not thousands of chests, boxes and bundles containing their store purchases and all sorts of oddments, the *Triona* or another of the Commission's vessels sets off for the Gilbert Group. Usually the vessel will have one or two dozen canoes lashed up in the rigging, these having been made by the kanakas in their spare time. The labourers, together with their families and most of their possessions, are all accommodated in the spacious 'tween decks which are fitted with large doors along the sides. These are kept open under ordinary weather conditions, thus ensuring the maximum amount of ventilation, while on deck large awnings are spread providing ample shelter. An official is first taken aboard, usually at one of the northern islands, to act as government agent during the trip, and then the vessel works south, calling at various islands to land repatriates. Their friends

from the various villages are usually awaiting them as the loaded boats reach the shore, only too willing to help in getting their luggage taken home, where a more than liberal distribution invariably takes place.

Sometimes recruiting is commenced while the landing operations are being done, but usually the procedure is for the local *kaubure* at each island to be informed as to when the vessel will call on her way north, and for any intending recruits to collect at the central village ready for signing on. The labour inspector can tell by the atmosphere on returning whether there will be a good response or not. If only a few people are about, and perhaps only the *kaubure* assembled at the *maneaba*, there will be very few recruits, but if the huge building is crowded to its capacity of say a thousand, and there is a buzz of excitement, it means lively work. All the natives will be squatting on mats, including the members of the *kaubure*, and behind them, a group of the native police. The three or four whites present are seated at a small table just inside the building, which has no sides, the roof sloping down to within a few feet of the ground. Incidentally, there is not a nail in its construction, coco-nut sinnet and native material being used throughout. The doctor and his orderly will have a tent near by, where the medical examinations are conducted. He is kept fully occupied, as not only the recruits, but also their wives and families have to be overhauled nowadays.

After the conditions of employment have been announced and explained to the gathering, word is given to intending recruits to come forward, and the

atmosphere becomes tense, assuming that *nako Banaba fever* (go to Ocean Island fever) is about. A dozen applicants spring up, each one is quickly examined by the doctor, questions are put to the *kaubure* as to whether his family affairs are all in order, and if so he signs on, or if unable to write, he touches the pen as his name is written. Usually a Gilbertese has a fit of bashfulness when asked what his name is. He finally bends down and whispers it to the government agent, or else a friend comes to the rescue and saves him from the trying experience. Frequently an applicant will be turned down for some reason or other, and on such occasions I have known a young fellow to slip off his jacket, rip it in halves, and throw down the pieces in disgust as he stalked off, to the accompaniment of roars of laughter from the multitude.

On one occasion a strapping chap who had been with us before told me he would be coming to sign on, and shortly after, he suddenly burst into the *maneaba* looking very upset, followed by two hefty young women who sat down on each side of him in a determined manner. As he rose to come forward, they grabbed his arms precisely at the right moment and pulled him down. This happened time and again, and I have rarely seen a native so angry. At last he muttered something equivalent to "throwing up the sponge," jumped up and strode off, accompanied by his two guardians, one on each side, and the crowd of course in fits of laughter. Sometimes disappointed applicants would behave more tragically, and once when recruiting at Tabiteuea, when

nako Banaba was very much in the atmosphere, two of them hanged themselves. Fortunately they were discovered and cut down just in time. The relatives of one finally relented, and he was allowed to sign on; it is no light matter to thwart a young fellow who has made up his mind to go to Ocean Island.

We had been recruiting at Nonouti once, meeting with very poor response, and were pulling down the lagoon in the whale-boat close inshore, when a young fellow was noticed racing for the beach, shouting out for the boat to stop. A good distance behind were two strapping young women in full pursuit. He was frightfully anxious to come with us, and the government agent, Mr Murdoch, on making the usual inquiries, found he was unmarried, and therefore free to go. He was told to jump in, and we would sign him on at the steamer. Simultaneously his two lady friends rushed up, waded out, and from each side of the boat leant across, grabbing him where handiest, which happened to be by the loin cloth. The boy clung on to this, yelling in terror lest it should be torn off, to his unending shame. The position called for vigorous action. We shouted out to the boatmen to pull, and they responded in their best style. The discomfited women, getting an impromptu ducking, had to let go, loudly voicing their disapproval of the proceedings, to the intense amusement of both whites and natives in the boat. Our recruit explained afterwards that they were his two aunts, who wanted him to stay behind and work for them, which to his mind was expecting too much.

On another occasion of recent years, when the Gilbertese were unaccountably averse to engaging for Ocean Island, our recruiting officers had waited patiently in the *maneaba* for one and a half hours without getting a single applicant, though there were a good many natives about. Just then the doctor came along from the adjoining tent wiping his streaming brow, and exclaimed "Doing splendidly, aren't we, just passed fifty likely young fellows. It's time for refreshments." The scamps had enjoyed the experience of a free medical examination, but had no intention of signing on. The laugh was obviously against the doctor, but the procedure in regard to his part of the operations was tightened up without delay.

At Arorae, one of the Southern Gilberts, Mr Murdoch and I once experienced a pleasing exhibition of muscular Christianity which quite saved the situation for us. We had struck bad westerly weather on the trip, getting mixed up in the surf on several occasions, and had to land on the eastern side of the island, usually a risky business. The recruiting was done, and the men sent on board, we remaining until the last, and following in the whaleboat. The surf was increasing rapidly, the tide was falling and it would soon be dusk. A start was made and it seemed as if we should get through safely, when a great big roller suddenly rose up ahead of us, curled over and broke into the boat, sending us crashing back on the reef with a plank stove in. One gets quite a genuine thrill at such times. The hole was hurriedly plugged up, the boat baled out, and we

prepared for another attempt, though not feeling at all happy about it. There was a big gathering of natives on the beach watching events, and all at once the two Samoan native pastors, seeing how they could help, shouted to the young fellows among the crowd. They at once responded, their surplus clothing was cast off, and a line of them on each side of the boat, with the pastors in the lead, "tracked" it out to the danger point near the edge of the reef. There they held it against the strong back-wash until there was a lull in the surf; then at the psychological moment, with a simultaneous mighty thrust forward, to the accompaniment of vigorous yells of course, our boatmen put their weight on the oars and out we shot beyond the last line of breakers.

A good many years ago I was recruiting at Nanomea in the Ellice Group, and during the operations a sturdy bright lad of about twelve years of age, in ordinary native costume, had come forward, but was rejected as being too young, to his great disappointment. Half an hour later a droll figure appeared in the *maneaba* dressed in a man's tweed coat, obviously to make himself look much older, and solemnly marched up to the table. All roared with laughter of course, but such enterprise and keenness deserved success, and he was signed on, to the marked approval of the crowd. During the years following, our young friend worked up to the position of "boat captain," subsequently joining the Colony Police Force. As Sergeant-Major Manuela he is now the senior constable on Ocean Island, and

the way he goes about his work is well worth witnessing.

The labour-changing trips are happy experiences for the Gilbertese and Ellice Islanders; the spirit of travel and adventure is strong in both Polynesians and Micronesians, and they would do much more in that line, even in their frail canoes, but migration is rightly checked by the authorities. Not only was there considerable loss of life, but various complications arose through it in early years, though the voyaging proved the means of populating many of the isolated islands throughout the Pacific.

The period of service at Ocean Island is one year only, but many of the labourers elect to renew for a further term, while others are glad to re-engage after a spell on their own islands. The experience on Banaba, with its opportunities of seeing the white man's ways and calling at the other islands of the group, is looked on by the young fellows, and their wives too for the matter of that, as being a necessary part of their upbringing. Apart from their useful earnings, it constitutes an outlet for their undoubted wanderlust, and an opportunity for seeing something of the world, limited though the Ocean Island horizon may seem. They come to us mostly as raw recruits, but develop into very useful manly fellows. Many of them learn how to handle carpenter's and other tools quite well, and they gain experience which stands them in good stead in after life.

ROAD IN THE PHOSPHATE SETTLEMENT, NAURU

BRUCE HIGHWAY ACROSS NAURU

CHAPTER XXV

THE PHOSPHATE DEPOSITS

At this stage we may digress and consider the nature and extent of the phosphate deposits, which during the period under review have been well opened up, and we can speak of what is actually visible when going round the workings, as the quarrying areas are called.

At Ocean Island the tableland area in the centre of the island more than fulfils the high expectations we had formed regarding the depth and quality of the deposit there. The coral pinnacles are larger in size but much fewer in number than about the slopes of the island, and quarrying is frequently carried to a depth of 45 feet or more, without coming to the actual bottom of the deposit. At this depth the phosphate narrows up a great deal between the bases of the pinnacles, and the mining then requires much care on the part of the overseers, owing to the tendency of the pinnacles to topple over suddenly, endangering the lives of the labourers. Though the upper portion of the limestone is solid enough, towards the base it is of a much more cavernous or crumbly nature; in many instances there is a distinct fault running right through the pinnacle at an angle,

as if a sharp earthquake had occurred in the remote past and fractured many of them.

The great proportion of rock phosphate in the Ocean Island deposit is a very noticeable feature, and also the remarkable variety of such rock. Some is almost as hard and compact as blue metal, other is soft and spongy, while flaky alternates with sedimentary rock, but all are mixed up, with fine gravelly phosphate in between, forming a heterogeneous mass. The sedimentary rock is seldom found in situ, and never in large slabs; pieces about three inches thick and consisting of seven or eight distinct strata are quite common, the colouring of the different layers ranging from cream to dark brown.

Then there are large masses of converted coral, sometimes weighing several tons, and retaining the original coral structure. The conversion process has been effected by the soluble phosphates from the overlying deposit having worked down and liberated the carbon dioxide, then combining with the lime to form tricalcic phosphate. The quality of this rock runs well over 80 per cent; it is usually somewhat higher in carbonate than the rest of the deposit; other much more fragile forms of converted coral are quite common, and sometimes in the crevices specimens of remarkably delicate structure are found, all turned into phosphate. After the conversion has taken place, the colour of the material changes from white to grey or brown, and it becomes much lighter in weight.

Occasionally lumps are found with almost a resinous appearance, indicating a comparatively high

percentage of fluorine, an undesirable impurity in phosphate rock, but this formation is not common, and therefore does not show up in the analysis of cargoes. Here and there pieces of stalactite phosphate and other cave formations are found, and sometimes hard pieces with strange wavy and concentric lines may be picked up; this material is in demand, as it polishes well and makes handsome paper weights. Some of the phosphate found in the cavities is highly coloured in various shades owing to an organic film which has spread over it. On one occasion the kanakas struck a small patch with a decided old gold effect. This was speedily appropriated by the overseer, to the disappointment of the boys who quite thought they had found real gold.

There is such a variety of formation and structure in the Ocean Island rock that a geologist wandering round the workings would be in the seventh heaven of delight. When I was in London, a world-famous analytical chemist showed me, with some pride, his collection of rock phosphate; I did not like to tell him so, but one could outclass it in half a day's ramble round the Ocean Island workings.

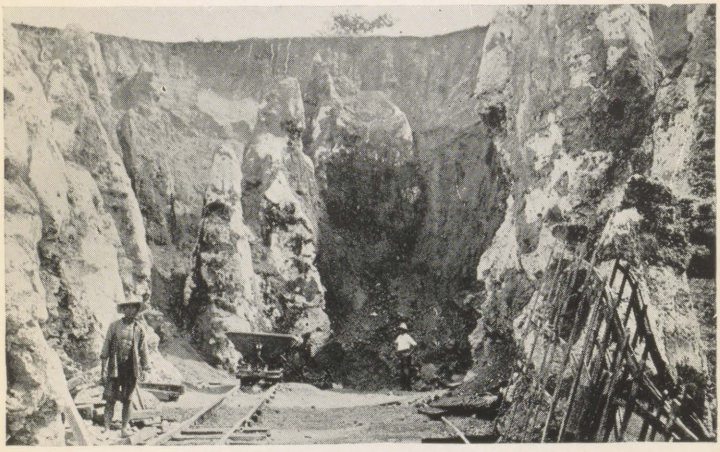
A noticeable feature about the deposit is that notwithstanding the extraordinary variety of rock, both in density and colour, the quality does not vary materially, certainly so far as the tableland area is concerned. In the lower levels, the percentage of calcium carbonate rises a little, but not to an objectionable degree. (For detailed analyses of representative samples of Ocean Island and Nauru phosphate see Appendix A.)

Our records show that from 1921 to 1934 the Ocean Island shipments have averaged about 88.25 per cent of tricalcic phosphate, and about 2.75 per cent of calcium carbonate, constituting ample proof that these deposits are the highest grade known; the iron and alumina percentage works out at about .85 per cent, and these being undesirable constituents, their low figure is another evidence of high quality.

There is no difficulty in separating the phosphate from the adjacent limestone pinnacles, the line of demarcation always being evident. In practice, the pinnacles are disturbed as little as possible, in order to avoid getting the limestone mixed up with the phosphate; some have to be blasted away to let the tramlines in to follow up the face of the deposit. When quarrying the lower levels, small cranes are useful for lifting the phosphate, and recently a long span cableway and a steam shovel have been introduced. The deepest excavation on Ocean Island so far is about 65 feet, with still some phosphate at the bottom of the quarry, though obviously narrowing up rapidly between the pinnacles.

The great proportion of rock in the Ocean Island deposit constitutes a material drawback in quarrying operations; the large masses have to be broken up with explosives and the boulders spalled down to a suitable size for the gyratory rock-breakers to deal with. At Nauru there is a much lower proportion of rock and the deposit is of a looser and more friable nature generally. This facilitates quarrying operations a great deal, also the work of discharging the cargoes, in that the material does not harden in the

SHALLOW FACE OF PHOSPHATE, EASTERN AREA, OCEAN ISLAND



DEEP FACE OF PHOSPHATE, NAURU

vessels' holds to the same extent that Ocean Island phosphate does.

The quality of Nauru shipments from 1921 to 1934 averages out at about 85.40 per cent tricalcic phosphate and 3.40 per cent calcium carbonate. The latter is in just the right proportion required for the manufacture of superphosphate, and the material is very popular in this and other respects for the preparation of that fertilizer. The depths of the deposits are not so great as at Ocean Island, but 25 to 30 feet in the better class country is frequently obtained. Fewer varieties of rock are to be found, and in view of the proximity of these two islands it is rather remarkable that so much difference exists in the characteristics of the deposits. We cannot account for this dissimilarity in any way.

A somewhat extraordinary discovery of phosphate below sea-level was made at Nauru early in 1929, when operations were being carried out in connection with the sinking of a well on the flat coastal belt adjacent to the power-house site. The excavation was taken down nine feet below the level of the ocean reef, which is dry at low tide, and the analyst, Mr K. M. Fennell, reported:

A sample of coarse alluvial (of which the phosphate strata is mostly composed) has been analysed, the results being:

	per cent.
Calcium phosphate	85.22
Calcium carbonate	5.44
Iron and alumina	0.73

The following is a short history of the excavation given me by the foreman in charge of the work:

"For the first 12 feet coral sand, after which coral-conglomerate to a thickness of 5 ft 6 in.; following this, semi loose 'flakey' coral, covered with a white coral slime; approximately 3 feet under this is a loose gravel-coral mixed with a few pieces of coarse alluvial phosphate. After this came the phosphate strata which was penetrated to the extent of about 6 feet; at this point a pinnacle was struck at one side of the well, sinking was discontinued and a bar was driven down a further 4 feet and still going easy, when operations ceased."

The sample of this material shows a particularly water-worn appearance, and there are several different formations of phosphate. However, no immediate commercial importance is attached to this find, though it is impossible to say what the future may bring forth.

Owing to the irregular nature of the bed-rock and its pinnacle form, definite figures as to the quantity of phosphate still on each island can hardly be given. Taking into consideration the area worked to date, and the results of various shafts sunk in different parts of the two islands, also certain other features, a conservative estimate is 20,000,000 tons for Ocean Island and 90,000,000 tons for Nauru.

The question naturally arises as to how these enormous masses of material of organic origin were formed. The theory most frequently heard is that the deposit is simply guano, and that the absence of ammonia is attributable to the action of the tropical sun and the occasional heavy rainfall. There is, however, no evidence, so far as Ocean Island and Nauru are concerned, to support this view, but there may be something in the theory held by Mr Dan-

vers Power and other authorities that guano is a contributing factor towards the existence of the deposit. In the pamphlet, *Phosphate Deposits of the Pacific*, he states:

> Phosphate rock was originally a limestone, or dolomite, but has had its carbon dioxide replaced by the stronger phosphoric acid. The soluble di-basic phosphate leached out of the guano has drained down to the underlying rock and taken up sufficient lime to form the less soluble tri-basic phosphate.

There can be no doubt that much of the phosphate rock has been formed in this way, even if the origin of the soluble phosphate is a debatable point. The softer coral is honeycombed and facilitates this conversion process, but it is difficult to see how the hard pinnacle limestone has entered largely into the formation of the deposit, as we never find a thicker phosphatic crust adhering to it than, at most, half an inch. In other words, that is the extent to which the soluble phosphates have penetrated, an insignificant degree compared with the many millions of tons of deposit. Danvers Power considers that the undoubted water-worn nature of a great deal of the phosphate is caused by the islands having been submerged several times since the deposits first accumulated.

Another difficulty regarding this theory is the fact that up to the present time we have never found fossilized seabird eggs or bones in the deposits. Danvers Power evidently considered that these existed, for he states (vide *Phosphate Deposits in the Pacific*) that two phosphatized eggs 2 by $1\frac{3}{8}$ inches

were found, cemented to the ground where they were originally laid. These so-called eggs were examined by the analyst on the island at the time, and by myself, and we agreed that they merely resembled eggs.

The fact is that there are so many remarkable formations on Ocean Island that one can find phosphate resembling almost anything, particularly in the way of concentric or oolitic structures. A kind of phosphate rock is frequently found exactly similar in appearance to the confection known as almond rock, but no one ever argues that it ever was that preparation. Seabirds' bones would be of a more stable nature than their eggs, but not a trace of them has been found. If they were washed away during the various subsidences, the question arises why the deposits generally did not share the same fate.

On the other hand phosphatized marine fossils exist galore; corals in great variety, various shells, including the clam (*tridacna*), one of which in my collection is $15\frac{1}{2}$ inches long, 8 inches wide, and 3 inches thick; also we find phosphatized sea urchins, and occasionally sharks' teeth, together with segments of their backbones. These facts favour an alternate theory that the phosphate deposits were originally of a marine sedimentary nature and came up from the sea bottom with the underlying limestone. When the island was up-raised the strata was broken up, becoming water-worn and mixed up by wave action into the heterogeneous mass in which it now exists. This view does not call for the several subsidences below sea-level which are neces-

sarily associated with the other theory as expounded by Danvers Power. Were one to admit the subsidences, the question arises as to what has become of the beaches, for accumulations of coral shingle might reasonably be expected, and there is no trace of these.

Possibly the nature of the deposits on other elevated coral islands may have a bearing on these question. While the typical low-lying island has no soil other than coral sand and shingle intermixed sometimes with low-grade guano, that is not the case with the elevated type. On prospecting expeditions I have examined islands which appeared identical with Ocean Island as regards the same pinnacle formation and limestone bed-rock. When holes were sunk down several feet, material exactly resembling phosphate was thrown up, but on getting to work with the portable laboratory, we found merely traces of phosphate present. Where, then, did this foreign material come from on a purely coral island? In the main, it must have come up from the sea bottom with the underlying limestone, or to some extent it may be the insoluble residue after the leaching away of the limestone, which in this case appeared to contain impurities, particularly iron. In close proximity to those islands there are large ones of volcanic origin, and the nature of the sea-bed there would naturally be quite different from that in the vicinity of Ocean Island and Nauru, far removed as they are from any other land masses.

Regarding our islands, the theory is that when they were up-raised, they brought up as a deposit the phosphatic remains of the marine organisms, so

plentiful in tropical seas where coral reefs are concerned and which, through some unknown cause, had become concentrated in that locality. These remains constitute the present deposits, though changed in formation owing to atmospheric conditions and the action of the more soluble forms of the phosphate on the adjacent coral. Speaking as a layman in the matter of geological problems, and with all due deference to those who, though without much local experience, have made a close study of the subject, I must confess that this theory appeals to me much more than that of the guano deposit submerged several times below sea-level and finally elevated in its greatly changed state, as we now have it.

Whatever the various theories may be, there is probably at least one feature common to all, namely that the phosphorus held in suspension in sea water, so frequently seen in the form of phosphorescence, is the first origin of the deposit. Just how it came to be collected in its present form, and in such enormous quantities on the two islands is the puzzle. It is interesting also to contemplate that Ocean Island and Nauru have been nature's laboratory on a gigantic scale, preparing for the use of mankind these deposits in such a remarkably pure form.

CHAPTER XXVI

WHAT IS THE USE OF PHOSPHATE, ANYWAY?

YES, what is the use of it? A very natural question for a man to ask on seeing a phosphate vessel discharging its cargo of dusty grey or light brown material; nondescript useless-looking stuff to the uninitiated. The natives of Ocean Island too are puzzled over the matter from another angle, and they ask why the white man in his wonderful country needs the rocks and soil from their little island to make his fields fertile.

Even in ancient times it was realized that continual cropping exhausted the soil, and the use of fertilizers containing appreciable quantities of phosphoric acid goes back to antiquity, though of course the people of those days were without any knowledge of their chemical composition. Probably it was the Romans who found out the benefit of using applications of ground bones, and in more modern times it was ascertained that depletion of the phosphatic constituents of the soil was the principal cause of decreased fertility. This naturally stimulated the demand for bones, and Great Britain, which was leading in the matter of agricultural science, imported large quantities from various continental

and other countries, sometimes from ghoulish sources, to a degree which called forth the wrath of the great German scientist Liebig, who wrote:

> England is robbing all other countries of their fertility. Already in her eagerness for bones, she has turned up the battlefields of Leipsic and Waterloo and of the Crimea; already from the Catacombs of Sicily she has carried away the skeletons of many successive generations. Annually she removes from the shores of other countries to her own the manurial equivalent of three million and a half of men, whom she takes from us the means of supporting, and squanders down her sewers to the sea. Like a vampire she hangs on the neck of Europe, nay of the whole world, and sucks the heart blood from nations without a thought of justice towards them, without a shadow of lasting advantage to herself.

No doubt this tirade was prompted by the fact that it had become a matter of common conjecture among scientists as to how long it would be possible for this world to produce enough food to support the increasing population, and this somewhat momentous problem caused serious misgivings. The position eased when the important discovery was made that mineral phosphate could be utilized for the same purpose as bones in supplying the deficiency of phosphates. In 1842 J. B. Lawes, the pioneer in the manufacture of superphosphate, found that coprolites, a form of phosphate rock, could be used for making that chemical fertilizer. Since then various phosphate deposits have been discovered in different parts of the world, and a vast industry has sprung up. (See Appendices B and C.) In 1930 the world's production of phosphate rock amounted to the

enormous total of 10,600,000 tons. Principally through this development, and the corresponding expansion of superphosphate manufacture, it has become evident that with more extensive agriculture and closer settlement, mother earth can support an immensely increased population for an indefinite period. Nowadays we do not hear anything of the unpleasant calculations as to when food-supplies for mankind will peter out, in fact there is much talk about over-production, though the world's actual problem is the uneven distribution of its produce.

Taking a more intimate consideration of the question as to the use of phosphate, we would find that if put to well-informed people in widely different walks of life, their answers would vary quite a lot, for a man naturally judges a thing by its connection with his line of business or occupation.

The commercial man's thoughts would turn to the big fertilizer companies with their immense output of superphosphate and basic superphosphate, the finished articles made from the produce of Nauru and Ocean Island. He would reflect on their earnings, and those of the merchants and others who distribute the fertilizers, the payment of railway freights and the wages of the many people employed in handling the material from the time it reaches Australia and New Zealand right on to the application of the fertilizer to the soil. He would say that phosphate is a very good line of business, and quite agree that it is of much importance to the community. If he were interested in shipping, he would give due credit to the industry for keeping a large number of ves-

sels employed in freighting the raw phosphate to these countries. The use of phosphate, however, goes much deeper than that.

The farmer, for instance, would reply that he must have phosphate in one or other of its various forms to get a good crop of grain, hay, turnips, or indeed of anything that grows; that he must top-dress the pastures for his dairy herd, otherwise the yield of butter-fat would soon fall off. He might mention as a matter of interest that the cows know by instinct when they are not getting sufficient phosphate in their herbage, and then have recourse to the strange habit of chewing bones to supply the deficiency. He could appropriately go on to explain how the immense shipments of grain, butter, cheese, frozen-meat, wool, hides, and tallow, are a continual drain on the phosphate resources of the soil, and thousands of tons of this vital constituent are sent out of the country in these exports. Unless he replaces what is thus taken away, the soil would reach the state of the pocket from which we keep taking money without replenishing it. This is all the more likely to happen because New Zealand and Australian soils are naturally low in phosphate. The deficiency is usually the "limiting factor," to use an agricultural term. If he were contemplating bringing more land into production he might explain that the barren-looking stretch of country near by was in that state solely because of phosphate deficiency, and that suitable applications, perhaps with the addition of a liberal liming, would transform it into

a good dairy farm, where one of his sons could make a start, and so forth.

From the veterinary point of view, the vital importance of phosphate in the animal economy has long been recognized; and the serious consequences resulting from an insufficient supply of this mineral have provided ground for intensive research by veterinary scientists. This has shown the various pathological manifestations occurring in the animal anatomy as a result of an insufficient intake of phosphate. When we consider that over 90 per cent of the mineral matter in the skeleton consists of calcium and phosphorus, it can readily be understood that when the supply of phosphorus in the feed is low, and such deficit continues for a time, withdrawal from the animal's skeleton takes place, with the resulting characteristic changes in the bony tissue, leading to porosity and brittleness of the bones.

The symptoms produced in cattle when insufficient phosphate is present in their food commence insidiously. Cows in milk in particular will suffer, for it has been shown by physiologists that in each gallon of milk produced, the cow gives roughly one-third of an ounce of phosphoric acid; a cow giving four gallons of milk daily has her system drained of one and one-third ounces of phosphoric acid per day. From this one gathers the great importance of the mineral in the feed. In dairy cows probably the first noticeable symptom of phosphate deficiency is a falling off in the milk yield; the animal develops an unthrifty appearance, evidenced by a staring coat and loss of condition. Other symptoms following

are a depraved appetite, such as chewing bones and sticks; the gait is cramped with frequent lameness and difficulty of movement. There is progressive emaciation, and in advanced cases of phosphoric starvation in cows, complete sterility may follow.

Such a train of symptoms was not infrequent amongst dairy cows in certain districts of New Zealand some years before the use of phosphatic top-dressing became established, but with the adoption of this latter practice, evidence of phosphatic deficiency in cattle became less and less. To-day it is occasionally met with, but usually in a less pronounced form. It can, however, be readily appreciated that in the event of a cessation of the application of phosphatic fertilizers to the soil, such resulting symptoms would again manifest themselves in cattle. This has actually happened in recent years, when on account of the economic depression a limitation of the necessary quantity of phosphatic top-dressing unavoidably occurred in many instances.

What has been said clearly emphasizes the importance of phosphate in animal nutrition.

What of the doctor: would the question come within his ken? There would be no doubt on that score, and his thoughts would probably run on the line of foods containing an insufficiency of phosphate, causing deficiency diseases of various types. If drawn out on the subject, he would explain how the compounds of phosphorus are vital to all life; that they enter immediately into the structure of every organ in the body, not only in the human anatomy, but of everything that exists, animal or vegetable. A

medical friend informs me that without phosphorus, life as we know it would cease; that every cell in the body contains this necessary element, and it is essential for the multiplication of cells and growth of the body. When we take cognizance of the various medical preparations to be seen in the chemists' shops every day which depend on compounds of phosphorus for their virtue, we have ample evidence that the medical faculty is emphatic as to the use of phosphates. If the man in the street thinks the case is rather overstated, no doubt the doctor would feel justified in giving his professional opinion that one of the worst things that could happen to the gentleman concerned, or to his growing family, would be that their daily food should be deficient in phosphate, for then all manner of physical complications would speedily develop.

In view of this consensus of opinion as to the value of phosphates, it may be of interest to consider just how they function in regard to plant growth, and why it is found by experience that they must be the principal constituent in all complete fertilizers, the foundation of manuring in fact. The recognized effect of applications of phosphate to the soil is to build up the strength of the plant, particularly in the early stages of growth. This is brought about by its action in developing the root system to a remarkable extent, numerous fibrous roots being thrown down. The plant is thus fitted for absorbing from the soil not only its further requirements of phosphate, but also the other necessary constituents for its growth. A young crop is

helped over the critical stage of getting a good start in life, and with a well developed root system it is naturally better fitted to withstand a dry time. The progress of the crop is also assisted by the further property that phosphate has of hastening the maturity, and speeding up the process of fructification. These features prove invaluable for wheat-growing in the dry areas, frequently resulting in the farmer reaping a crop when without the fertilizer there would be nothing worth harvesting. In Australia even so small an application as 60 pounds of superphosphate to the acre frequently makes all the difference between success and failure. Not only is the yield of grain increased, but its quality is also improved. Japanese have informed me that this is particularly the case in the cultivation of rice.

In addition to the direct action of phosphate in supplying plant food, there is also a secondary advantage in that the growth of useful soil bacteria is stimulated, to the benefit of the roots. Apparently an extraordinary degree of bacterial activity takes place in the soil, but full particulars are not available yet; it is a subject which is receiving a good deal of attention from agricultural scientists nowadays. It seems that there are good and bad bacteria, and quite possibly phosphate helps the former and deters the latter, at least I hope that is the way it operates.

As regards pastures, the application of phosphates by top-dressing increases markedly the proportion of clovers and trefoils, and adds to the mineral constituents and feeding value of the grass. The dairy herd instinctively recognizes this latter feature, and

the top-dressed portion of the paddock will be eaten down almost bare, while the untreated portion will be neglected, though perhaps containing an apparently good growth of grass. The young stock in particular do well on these top-dressed areas, a fact recognized by every practical farmer; quality in grass is even more important than quantity, and phosphate gives both. Its effect on clovers and other leguminous plants is particularly marked, and the stimulation of their growth also affords an important future benefit, in that they have the faculty of absorbing nitrogen from the atmosphere, storing it in small nodules attached to their root system. This nitrogenous matter is absorbed by the soil and fertilizes the grasses or any crop which may be put in subsequently.

In most of our New Zealand districts the practised eye can readily discern the degree to which top-dressing with phosphatic fertilizers is carried out on the various farms. On the one hand there will be a farm with patchy thin pasture, light in colour, and showing an abundant growth of weeds, which take control to an increasing extent year by year. Across the road it may be, the pasture will be dark green and healthy looking, with very little in the way of weeds to be seen, for the thick growth of grass and clover has crowded them out, assisted by the consolidating effect of the numerous cattle and sheep which such a farm can carry. Systematic top-dressing, and liming when necessary, have made the difference between the two farms, and no better object lesson as to the use of phosphate is needed.

Hilly country in particular frequently supplies us with very marked instances of the result of neglecting top-dressing; it has an unfortunate tendency to revert to its original state of bracken and native bush; the secondary growth of the latter, together with blackberry, gorse, and other vigorous weeds, cause a very difficult problem for the farmer in a few years.

The soils of southern Australia, as judged by old world standards, are markedly deficient in phosphates, and this, coupled with the climate, has been found to have a most important bearing upon the flora of the country. A great many of the Australian grasses and shrubs have a special adaptation to these soils, and on the whole their content of phosphate of lime is lower than the corresponding native vegetation in countries where the phosphate content is higher. There was a marked deficiency of clovers and trefoils in Australian native pastures before the advent of phosphates to Australia, which resulted in such pastures being deficient in balance and food content generally. Such pastures, however, were ideal for merino sheep, and there may be a close relationship between fineness of wool and low phosphate content. When the sheeplands were broken up and many of the slowly established native grasses destroyed, farmers in many districts found difficulty in maintaining live stock because of a real deficiency of herbage, and much attention was concentrated on the introduction of suitable pasture plants, more particularly in the drier portions of southern Australia; but following on the introduction of superphosphate

THE LIGHTER SIDE OF ISLAND LIFE: CRICKET

THE LIGHTER SIDE OF ISLAND LIFE: GOLF

in 1902, and its subsequent widespread use as a fertilizer for wheat, a rapid transformation of the pasture situation in wheat districts took place, because it was found that trefoils and leguminous plants of various kinds introduced accidentally from overseas, and other species of pasture plants, were rapidly establishing themselves on the cultivated land which had been previously fertilized, and so in the course of a relatively few years the pastures were transformed. The whole of this improvement was not without, in some respects, its drawbacks, one of which was that in suitable areas the trefoil which became most prominent was the burr trefoil, and the burrs of this seed soon appeared in the wool.

The benefit of the new style pasture was eventually so well recognized that even on the larger stations which still retained the original pastures, the pastoralists, although reluctant to part with them, ultimately recognized the commercial advantage of breaking up their land and ploughing and phosphating it, and so they commenced the widespread practice of bringing in share-farmers to cultivate the land to wheat and oats, and providing them with fertilizer phosphates.

In the heavy rainfall country English pastures such as rye-grass, perennial rye-grass, white Dutch clover, and cocksfoot, have been sown, and they have been found markedly responsive to the presence of superphosphate, and in all the dairying districts in southern Australia it is now routine practice to apply top-dressings of superphosphate. The effect of these relatively cheap dressings has in many cases increased

the productive capacity from 50 to 100 per cent or even more.

But perhaps the greatest advance that has been made in recent times is in respect of the high carrying capacity of grazing lands, upon which experience has proved that subterranean clover—provided it is top-dressed with superphosphate—will markedly improve the carrying capacity. Thousands of acres of such land have been improved in this way, and the carrying capacity on the average at least doubled. In some districts near the coast the phosphate deficiency in original soils was acute, and such areas not only failed to fatten the cattle, but it was impossible to breed a satisfactory lamb on them; in fact, in some cases, if grazing animals were maintained upon the pastures for any length of time, various serious troubles arising from phosphate deficiency made their presence felt. A good deal of such land when broken up and sown to pastures and liberally fertilized with superphosphate has been made most productive, and the diseases in question eliminated.

Throughout southern Australia there is practically no crop which does not respond to phosphoric acid, and indeed it can be said, without the annual top-dressing of water soluble phosphatic fertilizer, agriculture as it exists to-day could not be conducted.

It may be asked why Nauru and Ocean Island phosphate, if so high in grade, requires the expensive chemical treatment involved in the manufacture of superphosphate. The position is that tricalcic phosphate is insoluble in water, and therefore too slowly available for the plant. By grinding up the material

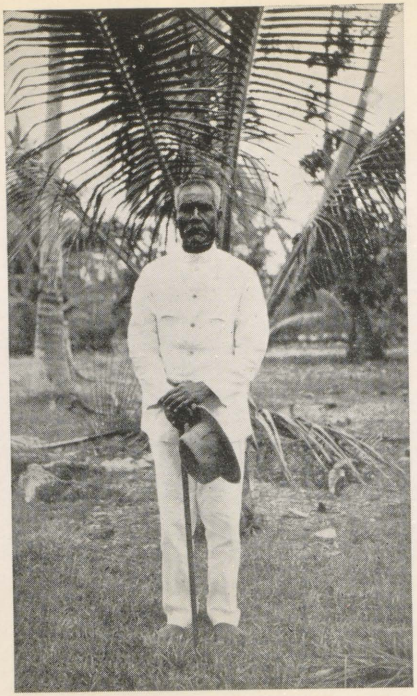
and treating it with sulphuric acid a chemical change is effected; the acid takes up sufficient lime to form calcium sulphate or gypsum, leaving the phosphoric acid with only sufficient lime to form monocalcic phosphate, which *is* soluble in water, and therefore immediately available for the plant. It may be supposed that heavy rains would dissolve all this soluble material and wash it away, but that is not the case; the monocalcic takes up from the soil sufficient lime to form dicalcic phosphate which though not soluble in water, can be absorbed as required by the plant roots, aided by the action of the soil waters which are slightly acid. If, however, there is insufficient lime for the monocalcic to obtain its requirements, it will combine with some of the less soluble constituents present, and thus become practically unavailable for the roots. Indifferent results from the use of superphosphate can usually be traced to this insufficiency of lime, and therefore one of the first considerations for the farmer is the question as to the lime content of his soil, for unless sufficient is present, the full benefit of applications of superphosphate cannot be obtained.

This may open up the question as to the desirability of applying monocalcic or water soluble phosphate, seeing that in practice it mostly reverts to the dicalcic or citrate soluble state. The only known explanation is that the phosphate applied to the soil in the most soluble form becomes intimately distributed through the soil in the finest degree, and is therefore readily taken up by the rootlets. Alternatively, applications of basic superphosphate or

reverted phosphate may be made, the phosphate present in these fertilizers being in the dicalcic form. Certain soils of a pronounced acid nature and under heavy rainfall conditions, frequently benefit from applications of finely ground raw phosphate, but generally speaking the response of the plant to this treatment is too slow.

In dealing with such problems the farmer should obtain the advice of a field adviser. Most of these difficulties have been cleared up, though there is still a great deal to learn as to what goes on in the soil. Actual field experiments too are a good guide, as mother earth invariably demonstrates what she requires to all who seek such knowledge.

How far does a ton of phosphate go in actual use? When treated with sulphuric acid and turned into superphosphate, it makes 1.8 tons of that fertilizer; therefore an 8000-ton cargo is equivalent to 14,400 tons of the finished article. For top-dressing purposes in New Zealand, three hundredweight of superphosphate per acre is considered good treatment, so a ton serves for approximately seven acres, and at that rate an 8000-ton cargo of the raw phosphate would be sufficient for 100,000 acres. Assuming dairy farms have an average area of 100 acres, this means that 1000 farms could be fully top-dressed through this one cargo of raw material. In practice, the farmer with 100 acres would not top-dress more than, say, two-thirds of his farm each year, so probably the 8000-ton cargo of raw phosphate, manufactured into fertilizer, would be sufficient for about 1500 dairy farms of average size.



ERI: LEADER OF THE BANABAN KAUBURE FOR MANY YEARS

OLD BIRIBO AND HIS TAME MAN-O-WAR HAWK

For wheat-growing in Australia, the figures are even more striking, and with an average dressing of 84 pounds of superphosphate per acre, it means that an 8000-ton cargo supplies the raw material for fertilizing nearly 400,000 acres. If the value of the extra yield of butter-fat and wheat through the application of phosphatic fertilizers was worked out by agricultural experts, as could be done, the figures would be remarkable, and if applied to the full output of Nauru and Ocean Island for a year they would be astounding. Perhaps some of our readers would be sufficiently interested to try!

Yes, there can be no doubt as to the use of phosphate and the growing importance it will have in helping to provide food for the world's increasing population. Only such considerations would justify the policy of spending so much money, energy and anxious thought in carrying on this unusual industry. Apart from the material aspect, however, there is a pleasing side in which the element of romance is not wanting, for these lonely coral islands, with their friendly and attractive native inhabitants, have an irresistible appeal.

CHAPTER XXVII

"KONAMAURI MA TIAKABO"

KONAMAURI! That's the word one hears most often on Ocean Island, so pronounce it correctly, if you please; Ko-na-mau-ri—each syllable of equal length, similarly to our Maori language here in New Zealand. Almost every Banaban or Gilbertese you meet says *Konamauri* to you; he may be smothered in phosphate dust, but that does not matter, he is not worrying. Every Banaban kiddy throws out his little brown chest, looks you squarely in the face, and gives the native greeting. If you respond with a smile, they will show what they can do in that line, and it is considerable. They must surely have some adage in their own language corresponding to "Smile boys that's the style."

In telling the story of the two islands, it has been my endeavour to take the reader there in spirit, as being the best way to visualize the unusual surroundings and the conditions attending the development of the phosphate industry from such small beginnings. So we continue in that strain, and now find ourselves expressing our thanks to the people there for the courtesy and hospitality ex-

tended to us during our visit. To myself, as the writer of this account, it gives opportunity of going further, and extending my best thanks to all who through the years have been associated with me in the industry in any capacity. The measure of success that has been achieved, has been the result of united effort, and I feel sure that I express the views of my fellow Commissioners and the members of the executive staff in saying that we gratefully acknowledge the co-operation of one and all. Without it, this book could not have been written as being the account of a successful island enterprise.

As we make our way down to the whale-boat waiting at the landing jetty to take us aboard, the spirit of farewell in native style is in the air, for from many of them, Banabans, Gilbertese, and Ellice Islanders, comes a wave of the hand and a hearty *Tiakabo* or "Good-bye." Perhaps one of the old Banabans will desire to express himself in rather more than the conventional way, and so he comes out with an emphatic *Konamauri ma Tiakabo* "Greetings and Good-bye." Our farewells to the little group of Europeans on the jetty have been said, and we are in the whale-boat. As the boatmen push off and bend to their oars, there is a chorus of *Tiakabos* from the natives gathered at the end of the jetty. We are soon dashing through the boat channel clear of the surf, and as we pass the launches and lighters, more *Tiakabos* are exchanged. A few steps up the companion ladder and we are aboard the deeply laden vessel; as the whale-boat

turns towards the shore *Tiakabo* is the last word we hear.

And so in the hope that the friendly reader has to some extent caught the local atmosphere of the islands, we extend to him also our hearty *Konamauri ma Tiakabo.*

APPENDICES

APPENDIX A

ANALYSES OF NAURU AND OCEAN ISLAND PHOSPHATE

	Nauru per cent	*Ocean Island* per cent
Calcium Phosphate	85·25	88·33
Magnesium Phosphate	·22	·79
Calcium Sulphate	·41	·36
Calcium Carbonate	5·09	2·45
Oxides of Iron and Alumina	·65	·69
Insoluble matter	·14	·07
Organic matter and combined water	3.86	2.62
*Calcium Fluoride and Alkalis undetermined	4·38	4·69
	100·00	100·00

K. M. FENNELL.

* Fluorine has been found to exceed two per cent in Nauru and Ocean Island phosphate.

APPENDIX B

TABLE SHOWING DEVELOPMENT OF WORLD PHOSPHATE PRODUCTION

YEAR	TONS (*approximate*)
1847	500
1850	5,000
1875	505,000
1900	3,150,000
1925	8,800,000
1930	10,600,000
1932*	6,800,000
1933	8,100,000
1934	9,100,000

* The industry was seriously affected by the world-wide depression, but it is evident that a definite recovery has set in.

APPENDIX C

WORLD PRODUCTION OF PHOSPHATE AND ESTIMATED CONSUMPTION FOR THE YEAR 1933*

	Production tons		*Estimated consumption tons*	
EUROPE				
Belgium	75,000		336,341	
Denmark	———		140,420	
France	75,000		1,058,877	
Germany	———		678,858	
Great Britain	———		396,767	
Holland	———		334,036	
Italy	———		658,087	
Portugal	———		107,567	
Russia	700,000		406,162	
Spain	15,425		518,028	
Sweden	———		107,129	
Other countries	15,300		316,979	
	———	880,725	———	5,059,251
AFRICA				
Algeria	587,750		48,400	
Egypt	440,600		———	
Tunisia	1,808,400		45,552	
Morocco	1,065,600		16,159	
South Africa	1,181		62,176	
	———	3,903,531	———	172,287
AMERICA				
*Curacao	84,225		———	
United States	2,346,217		1,695,682	
Other countries	2,009		18,817	
	———	2,432,451	———	1,714,499
ASIA				
Japan	30,380		711,268	
Other countries	7,928		9,785	
	———	38,308	———	721,053

* From tables by Mr A. N. Gray, London, published in the *Fertiliser, Feeding Stuffs and Farm Supplies Journal*, 30 January 1935.

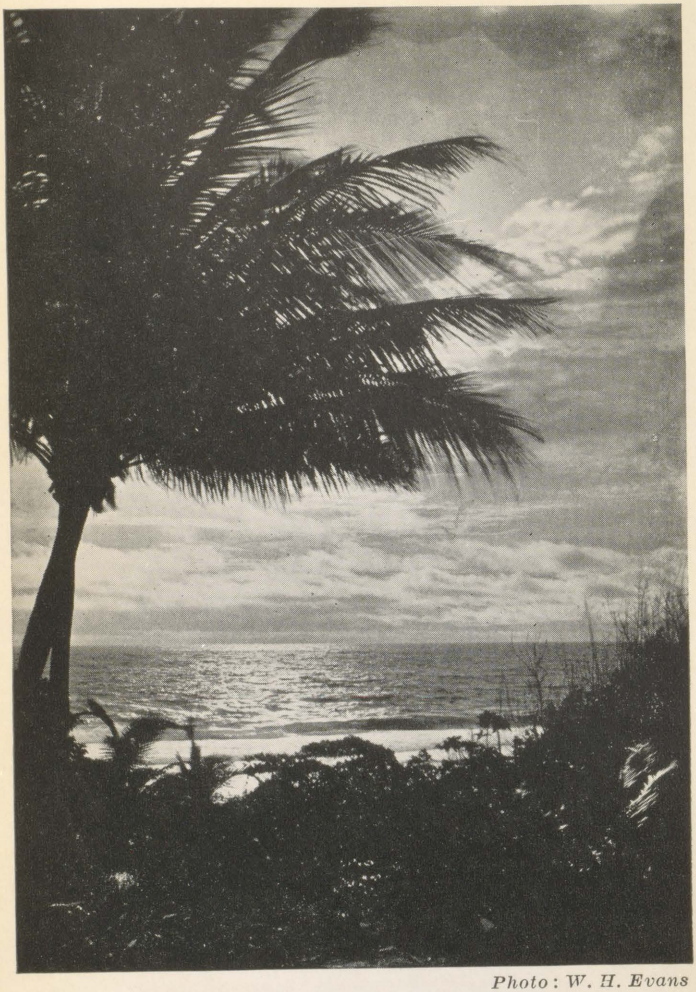


Photo: W. H. Evans

SUNSET AT OCEAN ISLAND

Pacific and Indian Oceans	*Production tons*		*Estimated consumption tons*	
*Angaur	74,425			
Australia	26		390,235	
*Christmas Island	92,740			
*Makatea	79,042			
New Zealand			162,309	
*Ocean Island and Nauru	558,043			
Other countries	8,016		6,452	
		812,292		558,996
	Total	†8,067,307		†8,226,086

* These Island deposits are recognized as the high grade phosphate sources of supply.

† The difference in figures for production and consumption indicates that stocks were less at the end of the year than at the beginning.

APPENDIX D

AGREEMENT BETWEEN HIS MAJESTY'S GOVERNMENT IN LONDON, HIS MAJESTY'S GOVERNMENT OF THE COMMONWEALTH OF AUSTRALIA, AND HIS MAJESTY'S GOVERNMENT OF THE DOMINION OF NEW ZEALAND

Whereas a Mandate for the administration of the Island of Nauru has been conferred by the Allied and Associated Powers upon the British Empire and such Mandate will come into operation on the coming into force of the Treaty of Peace with Germany, and

Whereas it is necessary to make provision for the exercise of the said Mandate and for the mining of the phosphate deposits on the said Island.

Now, therefore, His Majesty's Government in London, His Majesty's Government of the Commonwealth of Australia, and His Majesty's Government of the Dominion of New Zealand do hereby agree as follows:—

ARTICLE 1

The Administration of the Island shall be vested in an Administrator.

The first Administrator shall be appointed for a term of five years by the Australian Government; and thereafter the Administrator shall be appointed in such manner as the three Governments decide.

The Administrator shall have power to make ordinances for the peace, order, and good government of the Island, subject to the terms of this Agreement, and particularly (but so as not to limit the generality of the foregoing provisions of this Article) to provide for the education of children on the Island, to establish and maintain the necessary police force, and to establish and appoint courts and magistrates with civil and criminal jurisdiction.

ARTICLE 2

All the expenses of the administration (including the remuneration of the Administrator and of the Commissioners), so far as they are not met by other revenue, shall be defrayed out of the proceeds of the sales of the phosphates.

ARTICLE 3

There shall be a Board of Commissioners, comprising three members, one to be appointed by each of the Governments who are parties to this Agreement.

ARTICLE 4

Each of the Commissioners shall hold office during the pleasure of the Government by which he is appointed.

ARTICLE 5

The three Governments, or if they are unable to agree a majority of them, shall fix the remuneration of the Commissioners.

ARTICLE 6

The title to the phosphate deposits on the Island of Nauru and to all land, buildings, plant, and equipment on the island used in connexion with the working of the deposits, shall be vested in the Commissioners.

ARTICLE 7

Any right, title or interest which the Pacific Phosphate Company or any person may have in the said deposits, land, buildings, plant and equipment (so far as such right, title and interest is not dealt with by the Treaty of Peace) shall be converted into a claim for compensation at a fair valuation.

ARTICLE 8

The amount of the said compensation shall be contributed by the Governments of the United Kingdom, the Commonwealth of Australia, and the Dominion of New Zealand in proportions to be mutually agreed upon, or in the event of their failing to agree within three months of this agreement coming into force, then in the same proportions as the first allotment of phosphates under Article 14 of this agreement. Any other capital necessary for working expenses shall be contributed by the three Governments in the same proportions.

ARTICLE 9

The deposits shall be worked and sold under the direction, management and control of the Commissioners subject to the terms of this Agreement.

It shall be the duty of the Commissioners to dispose of the phosphates for the purpose of the agricultural requirements of the United Kingdom, Australia and New Zealand, so far as those requirements extend.

ARTICLE 10

The Commissioners shall not, except with the unanimous consent of the three Commissioners, sell or supply any phosphates to, or for shipment to, any country or place other than the United Kingdom, Australia or New Zealand.

ARTICLE 11

Phosphates shall be supplied to the United Kingdom, Australia and New Zealand at the same f.o.b. price, to be fixed by the Commissioners on a basis which will cover working expenses, cost of management, contribution to Administrative expenses, interest on capital, a sinking fund for the redemption of capital and for other purposes unanimously agreed on by the Commissioners and other charges.

Any phosphates not required by the three Governments may be sold by the Commissioners at the best price obtainable.

ARTICLE 12

All expenses, costs, and charges shall be debited against receipts; and if by reason of sales to countries other than the United Kingdom, Australia or New Zealand, or by other means or circumstances, any surplus funds are accumulated, they shall be credited by the Commissioners to the three Governments in the proportion in which the three Governments have contributed under Article 8 of this Agreement and held by the Commissioners in trust for the three Governments to such uses as those Governments may direct, or if so directed by the Government for which they are held shall be paid over to that Government.

ARTICLE 13

There shall be no interference by any of the three Governments with the direction, management, or control of the business of working, shipping, or selling the phosphates, and each of the three Governments binds itself not to do or permit any act or thing contrary to or inconsistent with the terms and purposes of this Agreement.

ARTICLE 14

Until the readjustment hereinafter mentioned, each of the three Governments shall be entitled to an allotment of the following proportions of the phosphates produced or estimated to be produced in each year, namely:—

United Kingdom	42 per cent
Australia	42 per cent
New Zealand	16 per cent

Provided that such allotment shall be for home consumption for agricultural purposes in the country of allotment, and not for export.

At the expiration of the period of five years from the coming into force of this agreement, and every five years thereafter, the basis of allotment shall be readjusted in accordance with the actual requirements of each country.

If in any year any of the three Governments does not require any portion of its allotment, the other Governments shall be en-

titled, so far as their requirements for home consumption extend, to have that portion allotted among themselves in the proportions of the percentages to which they are entitled as above.

Where any proportion of the allotment of one of the Governments is not taken up by that Government, that Government shall, when the phosphates are sold, be credited with the amount of the cost price as fixed by the Commissioners under the first paragraph of Article 11; but if such phosphates are sold to a purchaser other than one of the Governments any profit above the said cost price shall be carried to the surplus fund mentioned in Article 12.

ARTICLE 15

The agreement shall come into force on its ratification by the Parliaments of the three countries.

Dated this second day of July in the year of Our Lord one thousand nine hundred and nineteen.

Signed by the Right Honourable David Lloyd George for and on behalf of His Majesty's Government in London, in the presence of ERNEST EVANS. — (Sgd.) D. LLOYD GEORGE.

Signed by the Right Honourable William Morris Hughes for and on behalf of the Government of the Commonwealth of Australia, in the presence of R. R. GARRAN. — (Sgd.) W. M. HUGHES.

Signed by the Right Honourable William Ferguson Massey for and on behalf of the Government of the Dominion of New Zealand, in the presence of R. R. GARRAN. — (Sgd.) W. F. MASSEY.

BIBLIOGRAPHY

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(a) BOOKS.

The Cruise of H.M.S. "Bacchante,"	The private journals, letters and notebooks of Prince Albert Victor and Prince George of Wales, with additions by John N. Dalton, 1886.
The Great Days of Sail,	Andrew Shewan.
Through Atolls and Islands in the Great South Sea,	F. J. Moss, M.H.R. (N.Z.).
The Last Cruise of the "Wanderer,"	John Webster.
Life and Laughter 'Midst the Cannibals,	C. W. Collinson.
Land-Travel and Seafaring,	H. R. McClure.
Nauru (in German),	Dr K. E. Kretzschmar.
Corallogene Phosphat-Inseln Austral-Oceaniens (in German),	Carl Elschner.
Nauru (in German), 2 vols,	Dr Paul Hambruch, Hamburg, 1914 and 1915
Viajes Scientificos en todo, desde 1822 hasta 1842 (in Spanish),	Michelena y Rojas, Madrid, 1843.

(b) ARTICLES IN MAGAZINES AND JOURNALS, PUBLISHED LECTURES, ETC.

Pacific Navigation and British Seamen.	Commander T. B. Simpson of Barque *Giraffe.*	*The Nautical Magazine and Naval Chronicle,* London, 1844.
The Western Pacific, its History and Present Condition	Sir Ev. im Thurn, K.C.M.G., C.B.	*Geographical Journal,* London, Sept. 1909

Some Less Known Islands in the Pacific.	Sir Ev. im Thurn, K.C.M.G., C.B.	*United Empire,* London, March 1913.
Phosphate Deposits of Ocean and Pleasant Islands.	F. Danvers Power, M.Aust.I.M.M.	*Proceedings* of the Australasian Inst. of Mining Engineers, Vol. 1, No. 1, May 1904.
Coral Island Phosphates in the Making.	F. Danvers Power, M.Aust.I.M.M.	Lecture given at a meeting of the Inst. of Mining and Metallurgy, London, 16 Oct. 1919.
Phosphate Deposits of the Pacific.	F. Danvers Power, M.Aust.I.M.M.	*Economic Geology,* May 1925.
The Phosphate of Lime Industries of Ocean Island and Nauru.	T. J. McMahon, F.R.G.S., F.R.C.I.	*The Scientific Australian,* Melbourne, Dec. 1918.
Nauru, the Treasure Island of the Pacific.	T. J. McMahon, F.R.G.S., F.R.C.I.	*Stead's Review,* Melbourne, May 1919.
A British Phosphate Enterprise.	T. J. McMahon, F.R.G.S., F.R.C.I.	*World's Work,* London, June 1919.
A Bit of Pacific Romance unfolded on Nauru Island.	T. J. McMahon, F.R.G.S., F.R.C.I.	*Pacific Ports,* New York, Aug. 1919.
Nauru and Ocean Islands. Story of the Phosphate Discoveries and Workings.	A. F. Ellis, C.M.G.	*N.Z. Journal of Agriculture,* Dec. 1920
Phosphate Loading at Nauru.	A. F. Ellis, C.M.G.	*N.Z. Journal of Agriculture,* Dec. 1930.
Nauru and Ocean Island. Their Phosphate Deposits and Workings.	H. B. Pope.	*Journal of Agriculture,* Victoria, Aug. 1921.
Nauru and Ocean Island.	H. B. Pope.	*Journal of Agriculture,* Victoria, March 1922.
Nauru and Ocean Island.	H. B. Pope.	*Journal of Agriculture,* Victoria, Nov. 1922.
Phosphate Loading Equipment at Nauru.	E. R. Cornish, A.M.I.E.(Aust.)	*Commonwealth Engineer,* Melbourne, March, 1931.

Increasing Capacity of Phosphate Loading Equipment at Nauru.	E. R. Cornish, A.M.I.E.(Aust.)	*Commonwealth Engineer,* Melbourne, Dec. 1934.
Ocean Island.	Editorial.	*Blackwood's Magazine,* London, Nov. 1910.
Ocean Island and its Phosphate Industry.	E. Osborne.	*The Lone Hand,* Sydney, Nov. 1912.
The Settlement of the Pacific.	Sir Wm MacGregor, P.C., G.C.M.G.	*Scottish Geographical Magazine,* Edinburgh, May 1918.
Nauru, the Richest Island in the South Seas.	Mrs R. D. Rhone.	*National Geographic Magazine,* Washington, Dec. 1921.
Nature's Treasure Island, Nauru and Its Riches.	C. W. Collinson. F.R.G.S.	*Windsor Magazine,* London, March 1925.
Nature's Treasure Island.	Editorial.	*Life,* Melbourne, June 1925.
A Modern Treasure Island.	Capt. Neill Green, M.C., F.R.C.I.	*Life,* Dec. 1929, Jan. 1930.
The Social Organization of Banaba, or Ocean Island.	H. C. and H. E. Maude.	*Journal of the Polynesian Society,* Wellington, N.Z., Dec. 1932.
Phosphate Islands of the Pacific.	D. G. Martin, B.A.	*Chambers's Journal,* London, April 1932.
Equipment for Handling Phosphate Rock at Nauru and Ocean Island	Cecil Bentham, M.Inst.C.E.	Illustrated lecture given at meeting of the Inst. of C.E., London, Jan. 1934.
The Story of Nauru.	Prof. W. J. Dakin, D.Sc., F.Z.S.	*Walkabout,* Melbourne, March 1935.
A Tale of Small Beginnings.	Anon.	*Fertiliser, Feeding Stuffs and Farm Supplies Journal,* London, Nov. 1935.
Two Mid-Pacific Railways.	Anon.	*The Railway Magazine,* London, Dec. 1935.

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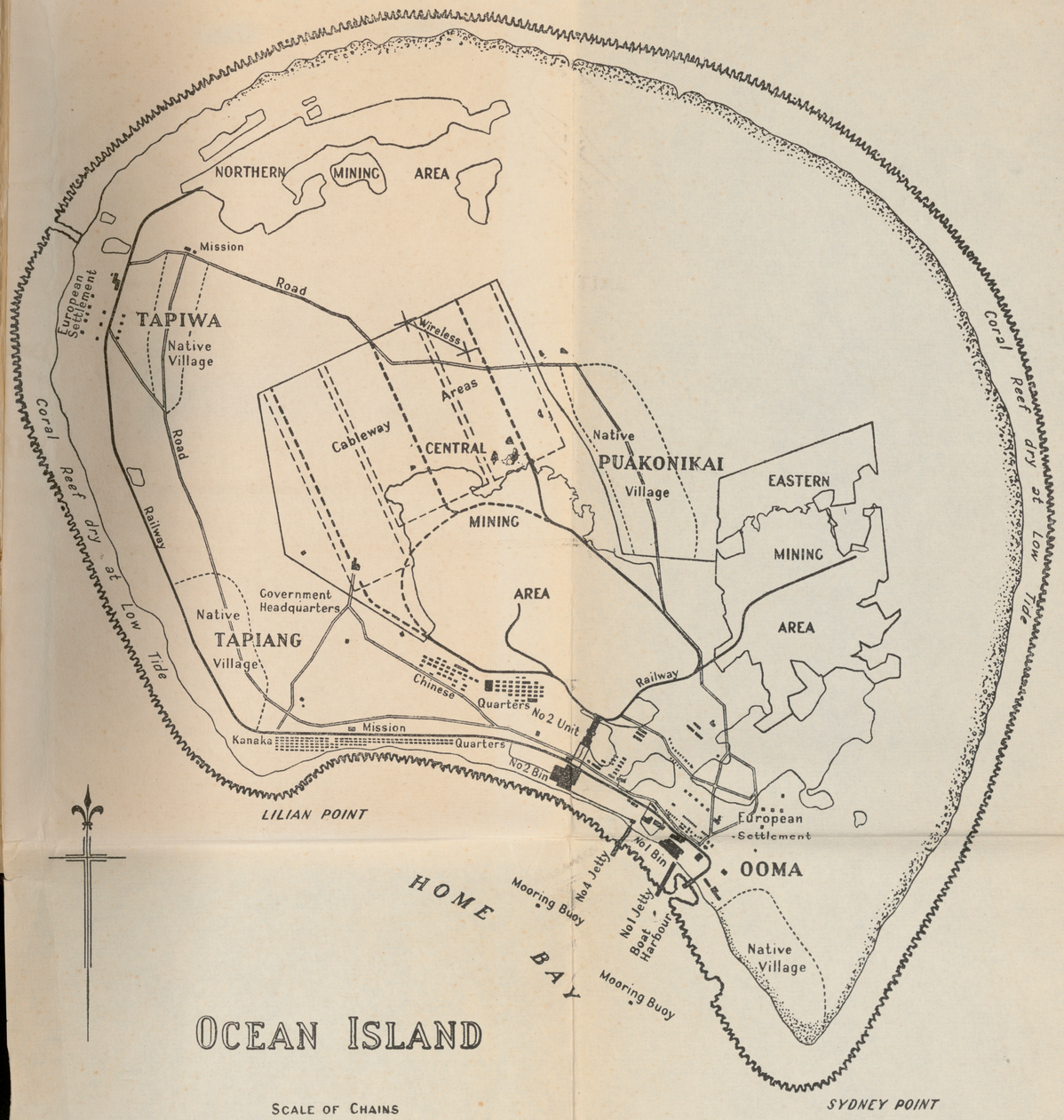
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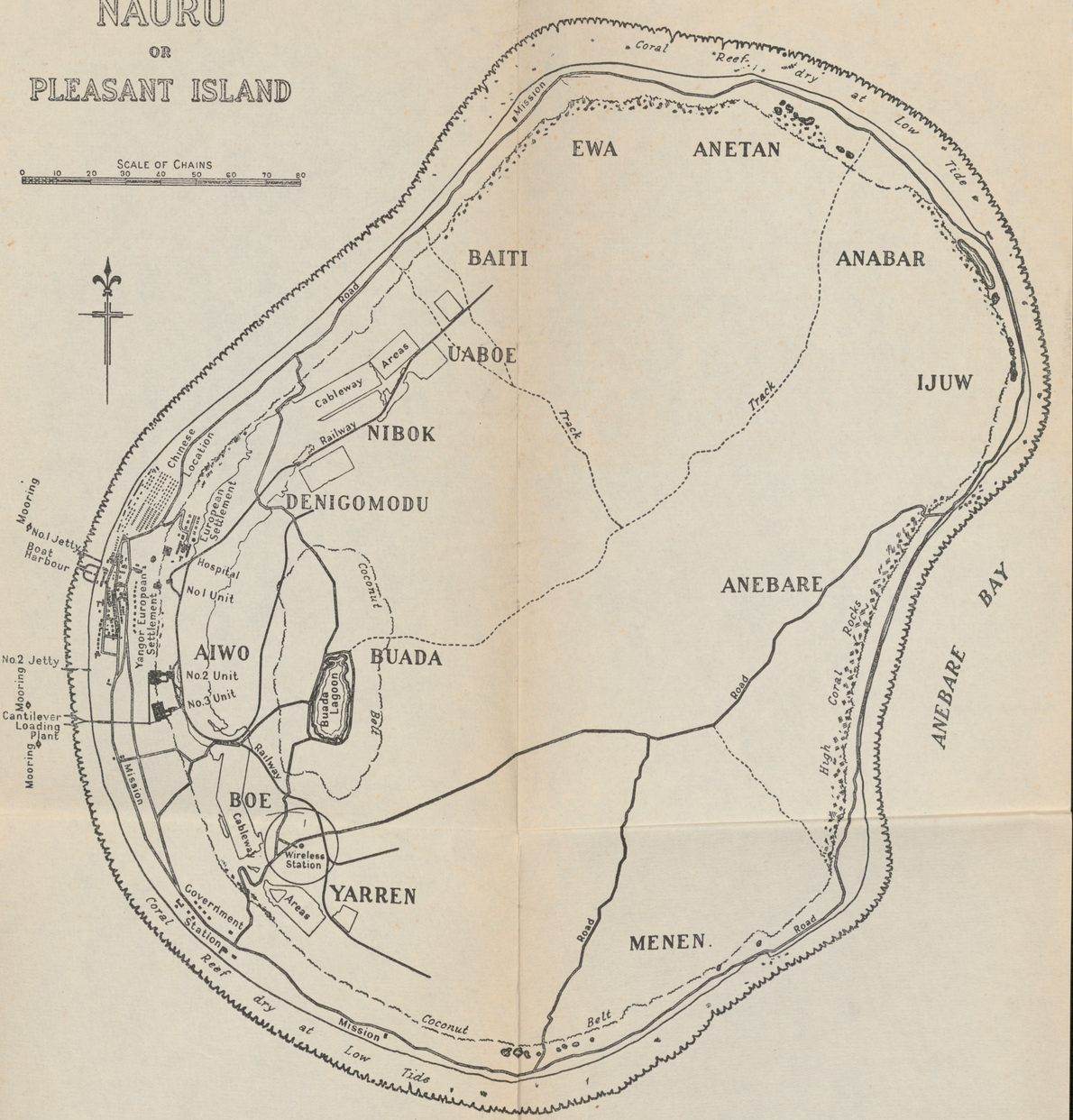
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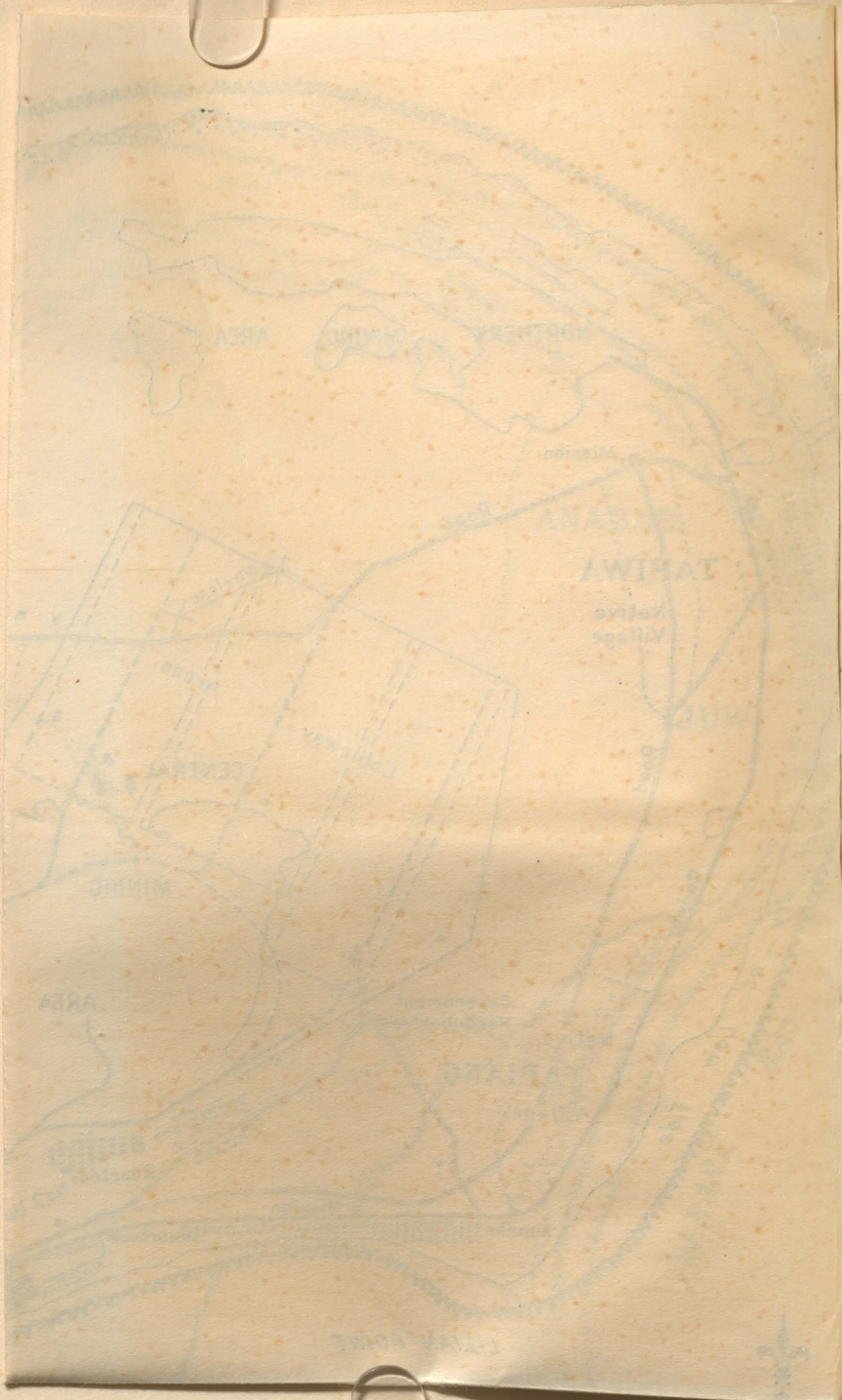

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