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A VISIT TO THE MERCURY ISLANDS

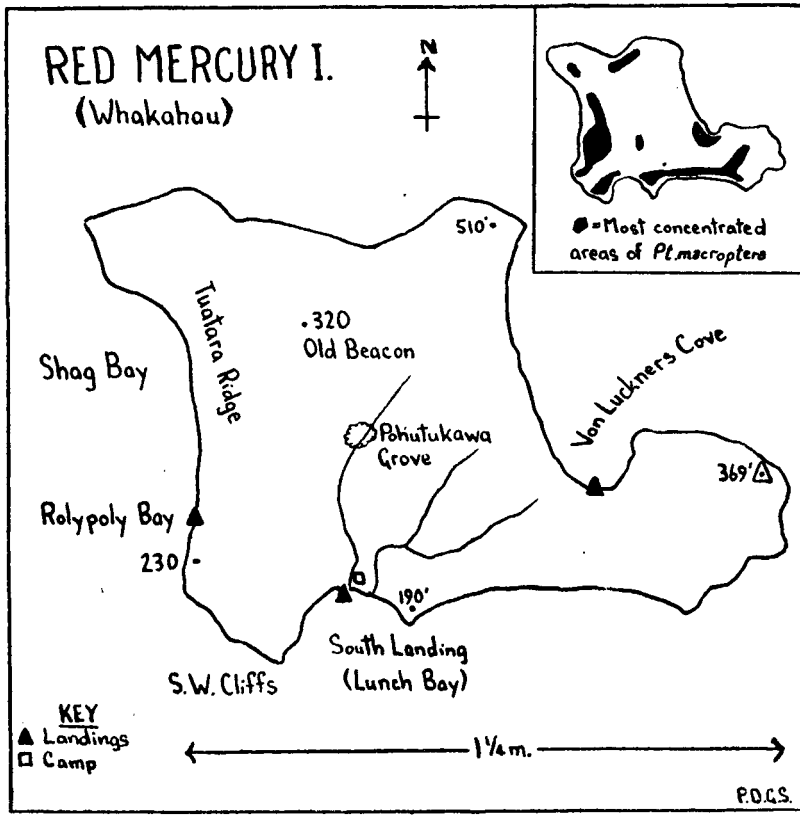
By A. T. EDGAR

The Mercury Islands were visited from 29th August till 12th September, 1961. The party was led by B. D. Bell, Wildlife Branch, Department of Internal Affairs, and included D. V. Merton and R. T. Hutchinson (Wild Life Officers); R. K. Blackburn, C. G. Cathie, D. G. Fenwick, M. J. Hogg, N. J. Ledgard, R. H. Sibson and P. D. G. Skegg (King's College Bird Club); A. Blackburn, R. B. Sibson, and A. T. Edgar (O.S.N.Z.). Transport from Auckland to and from Red Mercury, and from Red Mercury to Korapuki Island was provided by R.N.Z.F.A. Arataki. This account would be incomplete if it did not place on record our appreciation of the kind assistance given to the party by the Captain and ship's company of Arataki, and by Mr. J. Butterworth of Whitianga.

The Mercury Group consists of seven islands contained in a rectangle eleven miles by six miles (latitude 36°S, longitude 175°E) and lying off the east coast of the Coromandel peninsula. The southern shore of Great Mercury, the largest island, lies about four miles north of Tokorahu, the northern point of the peninsula which juts out between Mercury Bay and Whangapoua harbour, and the western point of the island lies about 12 miles east of Waikawau Bay; the relative positions of the other islands are shown on the sketch map. Mercury Bay was so named by Captain Cook, it being in this area that he observed the transit of Mercury in 1769. The Mercury Islands derive their name from their proximity to Mercury Bay; their alternative name, Iles d'Haussez, was recorded after they had been mapped by M. Lottin, who sailed under the command of Dumont d'Urville in the Astrolabe (1827).

Sailing from Auckland about 9.30 a.m., Arataki proceeded direct to Red Mercury, arriving there about 5 p.m. The plan was to camp on Red Mercury for about nine nights and on Great Mercury for five nights, working part of the group from each base. Apart from a few showers and dull periods, weather was fine for the first ten days, but a heavy swell ran for much of this period and on several days prevented launchings or landings. It was not till 8th September that a move could be made to Great Mercury; on that day the first two boat-loads got away in the morning without undue difficulty, but the swell worsened when the boat returned from its second trip and the rest of the party had to stay on Red Mercury till 11th September. The advance party took its tents, billies and part of the food, but the eating utensils were to go in the third boat and so did not arrive at Great Mercury for three days. Skilful improvisation dealt with this problem, but 36 hours of almost continuous and sometimes very heavy rain brought all operations on both islands to a standstill while everyone concentrated on keeping a fire going and the bedding dry. As a result of these unavoidable interferences to the planned programme, Middle and Green Islands were not visited, only a limited area of Great Mercury was covered, and no night work was practicable except on

Red Mercury, which island however was worked more thoroughly than would have been possible under the original plan. Besides study of bird life which was the main object, the less experienced members of the party had a good opportunity to improve their knowledge of plants, under the guidance of A.B., B.D.B., and R.B.S. The results of the expedition, though necessarily incomplete, provide a good basis for further study of a group which has in the past received less attention than most of the offshore islands. An unpublished report by Mr. L. C. Bell, who visited the group in February/March, 1951, was kindly made available by the Department of Internal Affairs, and proved most helpful.



Red Mercury (Whakahau) is about one mile from north to south and about 1.3 miles from east to west at its broadest point. There are cliffs round most of the coastline except behind South Landing (Lunch Bay) which provides an excellent camp site watered by two streams. The boulder beach offers a reasonably good landing when the wind is northerly, but can be difficult or impossible in fresh or strong winds from other quarters. On several occasions no more than a moderate swell obliged parties to embark from rock ledges at

the western end of the bay, and at all times transport of stores and gear over the boulders was an arduous task. On the evening of our arrival a southerly swell prevented landing at Lunch Bay, and for that night temporary camp was made at Southwest Landing (Rolypoly Bay), another boulder beach with a narrow strip of flat land between the beach and a steep hillside, but no water. On the east coast Von Luckner's Cove provides an anchorage sheltered from southerly and westerly winds and in suitable weather a reasonable landing, but only drip water from the cliff face appeared to be available. The island is undulating, rising to 320 ft. at the site of an old beacon, 369 ft. at the eastern point and 510 ft. at the north-east corner. On the northern side of the island the cliffs are relatively bare of vegetation but elsewhere pohutukawa has a good hold, with flax, ngaio and taupata on the lower slopes. The valley of the western stream is wooded, with a good variety of secondary growth trees, tree ferns and creepers, and a forest floor green with ferns; at the head of the valley there is a grove of old pohutukawas, and there are other groves on the steep slope behind Rolypoly Bay and to the west of Von Luckner's Cove. Karo is not common, but a few trees near the camp were a regular haunt of parakeets and bellbirds. There are a few kowhai trees in the wooded valley and many more on the banks of the eastern stream and on the scrub-clad slopes of the valley which it drains. The greater part of the island is covered in dense scrub, mainly mapou, mingi-mingi, hange-hange, tauhinu, maori broom and tough akepiro, not a great deal of manuka, which appears to be on the decline, suppressed by the vigorous growth of other species. Movement through the scrub is a slow and difficult operation. A good track was cut from Lunch Bay to Rolypoly Bay and this proved of great value for night banding work. The party spent one day east of the camp, working along the cliff edge to start with, then through thick scrub to the grove behind Von Luckner's Cove; down the cliff to the cove, up again across a big slip of bare earth and boulders to a small grassy slope on the headland, out to the eastern point and back along the boulders and undercliff of the southern shore. Another day the party worked from Lunch Bay to Rolypoly Bay, along the western shore, up the cliff and along the cliff top nearly to north-east point, thence back through scrub to the pohutukawa grove and down the western stream to camp.

The south-east point between Lunch Bay and Rolypoly Bay was well worked, and the greater part of the island was thus fully covered.

Double Island lies less than a mile to the west of Red Mercury, and consists of two small islands, rising steeply to 290 ft. and 360 ft. and joined by a boulder isthmus which is covered at high water. An attempt to land on 1st September was unsuccessful owing to the heavy swell, but on 6th September wind and sea were more favourable; a landing was made on the boulders and some hours spent ashore. The eastern island is well wooded, especially on the southern face; the western island has steep cliffs on the north, but the southern slopes are easier and under a cover of pohutukawa, taupata, rangiora and tawapou; some manuka on the high ridge, and on one steep slope a grassy patch is so honeycombed with Grey-faced Petrel burrows that it is difficult to walk over.

Stanley Island (Kawitihu) lies about $\frac{3}{4}$ mile south east of Double

Island, measures about 1 x ½ mile, and rises to 460 and 465 ft. at the two eastern corners, with red cliffs all round the coast, steepest on the northern side. On 3rd September a good landing was made on a shingle and boulder beach on the eastern side, where there is a continuous drip of fresh water; some pools of stagnant water were found on the northern cliff top. At the northern end of the island there are a few patches of thick scrub and one large slip of bare soil towards the west, but most of the area is under mahoe. Most of the southern end is under thick scrub, with a pohutukawa fringe and mahoe in the gullies. It was interesting to note that whereas on Red Mercury hangehange is very common and mahoe much less so, on Stanley mahoe is the dominant plant in suitable situations.

Middle (Flax) Island and Green Island (not visited) are steep well wooded islets lying between Stanley and Great Mercury. Logan Bell states that landing on Green Island is difficult except when the sea is calm, and the best time is at high water.

Korapuki (Rabbit Island) lying about a mile south of Green Island, is irregular in shape, about ½ mile long and less than ¼ mile wide, and rises to 245 ft. at the northern end. On 30th August a good landing was made on a stony beach on the western shore. Logan Bell quotes Dr. Falla and Mr. Sladden as stating that in 1925 much of the island was under grass and manuka, and reports that by 1951 there had been considerable regeneration of pohutukawa, flax, karo, mahoe and ngaio, with some grassland remaining at the northern end and scrub along the beach. Regeneration has continued during the last ten years; the steep slopes are covered with flax and young pohutukawas, mahoe is spreading quite strongly in sheltered positions but with the growing tips much browned off by wind on the ridge; kawakawa, poroporo and hymenanthera were also noted, and besides the ordinary manuka which persists on the ridges there were in a fairly sheltered area in the southern part of the island a few plants of a low growing and spreading habit, considered by A.B. to be *L. sinclairii*. Patches of grass remain on the ridges particularly at the northern end, and are heavily cropped by rabbits, which had also nibbled inkweed plants.

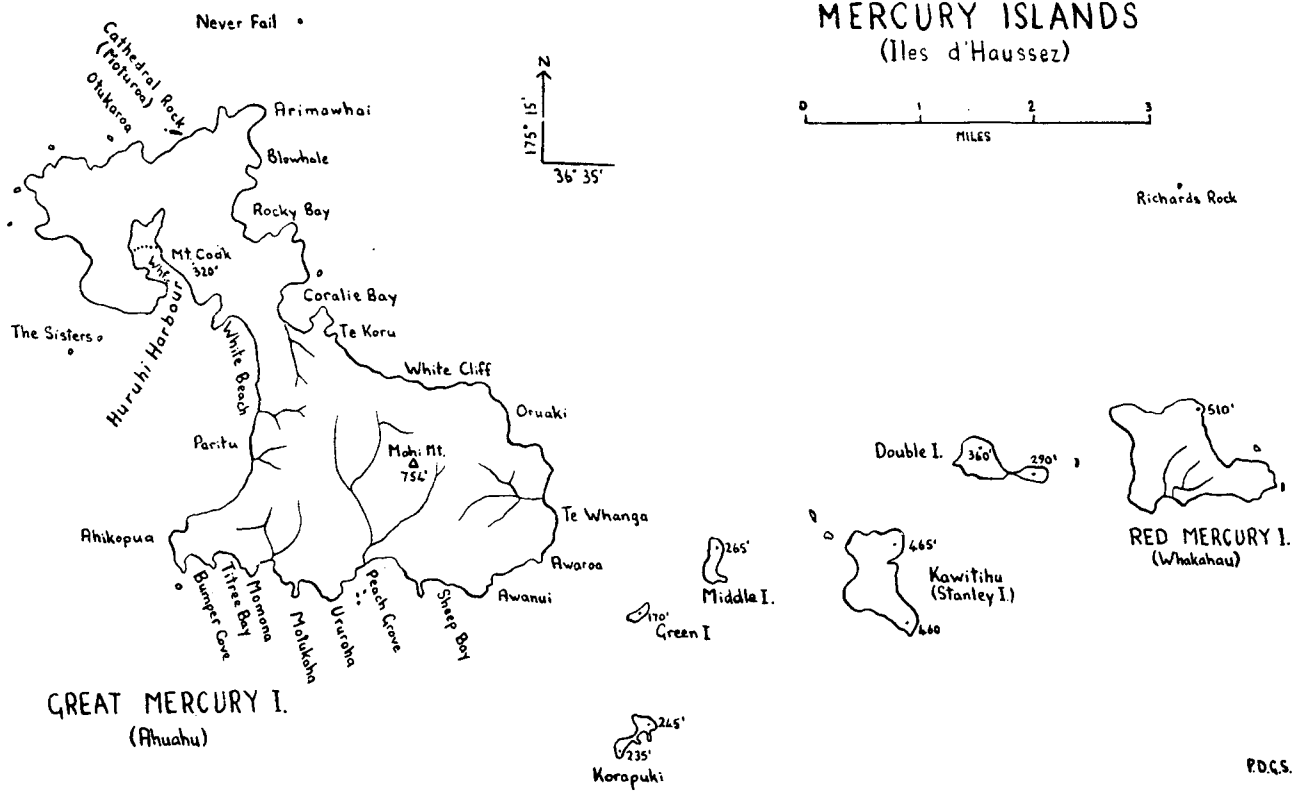
Great Mercury is owned and farmed by the Mizen and Delamore families and is partly under pasture, with considerable areas of scrub and gorse. Camp was made in a sheltered pohutukawa grove some distance inland from and at a higher level than the sandy beach of Sheep Bay, on the south coast of the island; for any future visit permission will be sought to camp further west in the bay known as Peach Grove, where there is an abundant supply of good stream water.

EVIDENCES OF PREVIOUS OCCUPATION

A collection of very old human bones was found under a large rock near the camp at Red Mercury. Fragments of obsidian were picked up on Red Mercury, Stanley, Korapuki and Great Mercury. Logan Bell records built up stone terraces on Double Island; we found the remains of small stone walls in the wooded valley on Red Mercury, and heaps of large grey stones on the ridge at Stanley.

MAMMALS

The Maori rat or Kiore *(Rattus exulans)* is common on Red Mercury. A number were seen during night banding operations, and


MERCURY ISLANDS
(Iles d'Haussez)
0 1 2 3
MILES
N
175° 15'
36° 35'
Never Fail
Cathedral Rock (Proturoa)
Otukaroa
Arimawhai
Blowhole
Rocky Bay
Mt Cook 320'
Wht
Coralie Bay
Te Koru
The Sisters
Hururhi Harbour
White Beach
White Cliff
Oruaki
Paritu
Mahi Mt. 756'
Te Whanga
Awaroa
Awanui
Ahikopua
Bunger Cove
Titree Bay
Momona
Maluketa
Ururoha
Peach Grove
Sheep Bay
GREAT MERCURY I.
(Ahuahu)
Richards Rock
Double I.
360'
290'
510'
RED MERCURY I.
(Whakahau)
265'
Middle I.
465'
Kawitihu
(Stanley I.)
660
170'
Green I
245'
235'
Korapuki

P.D.G.S.

they became rather troublesome around camp (one night five were found in the bread box); a total of 27 were trapped. Logan Bell recorded rat droppings on Korapuki, and found on Double Island (as did our party) tawapou seeds of which the kernels had been eaten. We found a "store" of tawapou seeds on Red Mercury, in the rotten wood at the base of a small tree which had been cut or died back and then grown a double stem. Scattered damage to bark of taupata and mahoe at Stanley and Red Mercury was attributed to rats. Small squares of taupata bark had been eaten; the bark damage to young mahoe trees was of various types — one small sapling had been skinned up to about three feet from the ground, a fairly large patch at the base of an 8-inch circumference sapling had been eaten, small branches were found partially ringed, and small vertical or horizontal strips and small squares had been eaten on larger branches, up to 6 ft. from ground level.

Rabbits are present on Korapuki and on Stanley; as far as was seen they were not causing any significant damage to the vegetation, but may be holding back some regeneration, particularly on Korapuki.

On the afternoon of September 8th a big sea was running off Lunch Bay. A school of dolphins moving eastwards crossed the bay well out to sea and shortly afterwards three much larger creatures rounded the point closer inshore and followed the dolphins; from their large size and shark-like dorsal fins they were identified as Killer Whales.

REPTILES AND FISH

Only one Tuatara *(Sphenodon punctatus)* was seen. It was about 12 inches long, thought to be a female, and was found in a burrow, one of many in that part of the wooded valley on Red Mercury. A gecko was seen, and several brown skinks were observed among the boulders on the beach at Red Mercury. Logan Bell mentions black skinks living among dark brown dried seaweed on the beach at Korapuki.

A 9-inch native trout or Kokopu *(Galaxias fasciatus)* was found in the western stream and freshwater eels (Tuna) in both the streams on Red Mercury. Welcome additions to camp rations were gifts of crayfish and hapuka from Mr. Butterworth and snapper, red moki, rock cod and conger eel caught by members of the party.

BIRDS

Dr. R. A. Falla (The Distribution and Breeding Habits of Petrels in Northern New Zealand, Records of the Auckland Institute and Museum, Vol. I, No. 5, July 1934) records breeding on the Mercury Islands of petrel species *Pelagodroma marina, Puffinus carneipes, P. gavia* and *Pterodroma macroptera.* To these can now be added *Puffinus assimilis* and *Pelecanoides urinatrix.*

The banding record is as follows:—

P. macroptera	800
P. gavia	24
P. assimilis	42
Total Bandings	866

About 150 birds were banded around the camp area at Lunch Bay, the balance mostly on the steep wooded slopes behind Rolypoly Bay; on the first night of our stay this very productive area gave 200 *P. macroptera* plus 6 *P. assimilis* bandings.

Bellbirds, Red-fronted Parakeets, Fantail, Grey Warbler, Silver-eye, Kingfisher, Morepork and Harrier were observed on all the islands. No pipits were seen but no doubt these occur on Great Mercury. Tuis were scarce or absent, but probably occur in greater numbers when the pohutukawa is in flower. No Pigeon were seen, but Mr. Butterworth states that they sometimes visit the smaller islands.

Distribution of Parakeets, Owls and Passerines

Native Birds	*Red Mercury*	*Double Island*	*Stanley*	*Korapuki*	*Great Mercury*
N.Z. Parakeet	x	x	x	x	v
Morepork	a	v	v	–	v
Fantail	x	v	x	a	v
Grey Warbler	x	v	v	v	v
Bellbird	x	v	x	v	v
Tui	2	–	–	1	v
White-eye	x	v	v	v	v
European Birds					
Skylark	–	–	–	–	v
Song Thrush	–	–	–	–	v
Blackbird	a	a	a	v	v
Dunnock	a	v	v	–	v
Redpoll	–	–	–	–	v
Chaffinch	a	v	–	–	v
Yellowhammer	–	–	–	–	v
House Sparrow	–	–	–	–	v
Starling	v	v	v	–	v

Legend: x = population estimated at over 20 pairs
a = less abundant, probably 5 - 10 pairs
v = observed, but no estimate of numbers made.

The ornithology of Great Mercury will repay further investigation. Only a small part of the island was covered on this visit, and it is fairly certain that many additions could be made to the list of species if the island was thoroughly worked. It appears that some of the passerines may breed rather later on Great Mercury than on the mainland; Skylarks, White-eyes, Chaffinches and Yellowhammers were still in flocks on 12th September. Around Auckland flocks had generally begun to break up by the end of August.

NOTES ON SPECIES

(Including those observed from the ship on outward and homeward passages)

NORTHERN BLUE PENGUIN — Numerous and breeding. Tracks and droppings were found on all islands visited, and about 9 p.m. on 10th September 49 birds were counted clambering over the boulders on a 250-yard stretch of beach near the camp at Red

Mercury; this was by no means the total number coming in from the sea on this small part of the coast as when a bird was caught for examination its squawks were answered by many birds which from the direction of their cries would not have been included in the visual count. One bird came into the camp on 31st August and waddled right up to the entrance of a tent, apparently undisturbed by the light of an oil lamp burning within. At Von Luckner's Cove there is a broad, clearly defined penguin track leading up to the top of the cliff, and burrows were found far up other hillsides, in scrub, as well as close to the beach. A burrow on the cliff face at Lunch Bay was empty when examined on 30th August, but contained an egg when re-examined the following day.

NELLY — Single birds were seen offshore from Double Island (1st September) and Red Mercury (6th September); one in Auckland harbour mouth on the outward journey; two off Cape Colville and two young birds in Hauraki Gulf on the return journey.

CAPE PIGEON — One in Hauraki Gulf on the outward journey; on 30th August a single bird followed Arataki from off Red Mercury as far as Korapuki; it sailed around, settled on the water close alongside, and accepted bits of bread thrown to it from the ship.

BROAD-BILLED PRION — A corpse was found on the beach at Great Mercury, in a condition which indicated that it had probably been cast up in the June, 1961, gales.

BULLER'S SHEARWATER — None seen on the outward passage or around the islands, but on the homeward passage (12th September) c. 17 birds (8 in a party) were noted in Hauraki Gulf between Waiheke and the Noises, together with numerous parties of Fluttering Shearwaters. Logan Bell mentions that Buller's Shearwater nests on the north shore of Red Mercury but it is understood that this statement needs confirmation, being based on sighting of a large concentration offshore by Dr. Falla and Mr. Sladden.

FLUTTERING SHEARWATER — Small and large parties in Hauraki Gulf on the outward and return journeys were sometimes alone, sometimes associating with White-fronted Terns and on the return journey, when over 1000 were seen, with Buller's Shearwaters also. Parties off Red Mercury and Korapuki associated with Red-billed Gulls feeding offshore; on 31st August after a day of strong north-east winds and high seas the wind changed to north-west in the afternoon, and of a great congregation of petrels wheeling far out to sea but visible from the shore, roughly 30% were Fluttering or Allied and 70% probably Grey-faced.

P. gavia and *P. assimilis* came in from the sea rather later than did *P. macroptera,* and the first *P. gavia* calls were heard between 53 and 68 minutes after sunset, when it was quite dark. The normal full call sounded like "ka-how ka-how ka-how ka-how kehek kehek kehek kehek errr"; the "kehek" is sharper, faster and slightly higher pitched than the "ka-how," and the final "err" tails off as a rather drawn-out note, at a lower pitch. Another version sounds like "ka-how ka-how ka-how ka-how ke-errr ke-errr." The birds were noisiest on 4th and 5th September, much quieter on 6th September when the main call heard was the usual series

of "ka-how . . ." followed by a short series of "errr . . ."; in some cases the "ka-how . . ." series was omitted. Morning departure was spread over the period between 3.30 and 5 a.m. (a few laggards as late as 5.30 a.m., sunrise at this time being around 6.35 a.m.) and though quite a lot of calling was heard, was much less noisy than the period of arrival. On the morning of 5th September some of the outgoing birds produced yet another call which sounded like "ke-hoo oo-oo." All the above calls of *P. gavia* have a disyllabic quality by which we considered we could distinguish them from the multisyllabic calls of *P. assimilus;* on the night of 7th September, just before a spell of bad weather, we heard a new call, a rapid "kuk-kuk-kuk" or "kuk-kuk-kuk-kuk"; this is probably the "sound resembling the cackling of a fowl, especially before bad or wet weather" (Oliver, quoting Reischek). To our ears it was vaguely reminiscent of the sound of distant short bursts of automatic fire.

We were too early for eggs, but unoccupied burrows with white breast feathers identified as those of *P. gavia* were found on the slopes of Korapuki. On Red Mercury similar burrows were found on the western cliff and elsewhere, frequently near or actually under rocks. A proportion of the birds banded were caught at Rolypoly Bay, the balance at Lunch Bay mostly not far above boulder level on the taupata/ice plant slopes, two actually on the boulders. Although the full breeding population may not yet have been coming ashore, the number of birds heard coming in was still greater than the small number of bandings (24) would indicate; this is probably because most of the banding operations took place in the wooded areas where the population of *P. macroptera* was greatest, but which situations were less favoured by *P. gavia.*

ALLIED SHEARWATER — On Red Mercury 15 birds were banded in Lunch Bay and 27 in Rolypoly Bay, in the wooded areas which also carried the greatest numbers of *P. macroptera* burrows. Unoccupied burrows with small entrance holes and scattered feathers thought to be those of *P. assimilis* were also found at the top of the northern cliff, in an area thinly occupied by *P. macroptera.* An adult bird was found in a burrow on Korapuki, but none on Stanley or Double Islands. Burrows were generally 3-4 ft. long, the chamber usually lined with a few leaves (pohutukawa, karamu, mahoe or rangiora); one nest also contained some penguin feathers and breast feathers of *P. assimilis.*

Although the species is normally classified as a winter breeder it is evident that the season on Mercury Islands is considerably extended. A young bird (estimated age 21 days) was found in a burrow on September 5th; on three occasions (September 1st, 4th and 5th) burrows inspected at night were found to contain two birds and in each case a third bird was sitting outside the burrow; the bill of the Korapuki bird (August 30th) was caked with soil as if it had recently been burrowing; one bird taken from a burrow was considered from the condition of the cloaca to be a hen which would shortly lay; and on September 3rd near Western Stream an unlined burrow was found to contain a fresh egg.

Like *P. gavia, P. assimilis* came in from the sea about an hour after sunset and departed about two hours before sunrise; both species are much more active on the ground than the sluggish *P. macroptera* and therefore less easily caught for banding. The *P. macroptera; P. assimilis* banding ratio of 800: 42 is probably much more closely related to actual population than the *P. macroptera; P. gavia* ratio 800: 24. Unlike *P. macroptera* and *P. gavia* which appear on coming in from the sea to pass through the canopy of foliage and land directly on the ground, quite a number of *P. assimilis* were seen in branches of trees up to 20 ft. above ground; there was no indication that these birds were distressed and it seemed that they were merely making the descent in two stages, first landing in the foliage, later dropping from the branches to the ground. All birds seen in such situations were observed during the early part of the night, so it is unlikely that they had climbed the trees for the purpose of take-off.

The normal call is a rapid "kakakakakakak urrr," repeated; it reminds one of the cackle of a hen after it has laid an egg, the "urrr" sounding as if uttered while drawing breath. On the outward flight a slightly modulated call "hek hok how hek" repeated once or twice with pauses between series, was sometimes heard and attributed to this species.

GREY-FACED PETREL — Found breeding on all islands visited, and by far the most abundant species on the smaller islands of the group. On Great Mercury (Sheep Bay) a few birds were heard calling, a few burrows were found, also one dead bird partly plucked (perhaps by a Harrier); we were told that burrows can also be found in other parts of the island. On Red Mercury the greatest concentration of burrows was on the steep wooded slope behind Rolypoly Bay; numerous burrows were also found behind Lunch Bay and Von Luckner's Cove and all the way up the valley of the western stream; there were scattered burrows on top of the northern cliffs but very few in the areas of dense scrub. The same preference for wooded areas with a relatively bare floor was noted on other islands; on Double Island however an open grassy patch was so honeycombed with burrows that it was difficult to walk over. The burrows of *P. gavia* and *P. assimilis* had smaller entrance holes and were generally longer than those of *P. macroptera,* often with a bend in the tunnel; *P. macroptera* burrows had a large entrance hole, were usually about arm's length and straight. Two burrows were longer (about 5 ft.); one was straight, the other so curved that in plan the egg chamber was only a little forward of the entrance hole.

The main hatching apparently took place in the last week of August and the first week of September. Numerous chicks, estimated to have been hatched between August 21st and September 4th were in sooty grey down with black bills and dark grey feet. A number of addled eggs found lying on the ground had probably been laid "wild." and a number of broken eggshells had probably been cast out from burrows. Writing of the Manx Shearwater, Lockley (1942) states that when two eggs were laid in a nest, neither would hatch. On September 6th we found a burrow containing two eggs; one of these was stone cold and apparently addled, but the other was fertile, and just chipping.

A ten-day-old chick when handled spewed its oily stomach contents all over the handler; a sample contained the remains of an euphausid shrimp and the eye of a small fish. It was noted that burrows containing chicks sometimes had a quantity of sticks and leaf litter in the entrance, which had the appearance of having been placed in position. We were informed that some mutton-birding is done on Red Mercury.

Grey-faced Petrels began to assemble fairly close inshore some time before dusk, earlier on dull cloudy days. The species is seldom seen near the coast except when arriving at or departing from its breeding ground, but on four days of strong winds large dark petrels, which could only have been this species, were seen during the early afternoon wheeling and careening well out to sea but within the limit of visibility, in numbers estimated from 3 - 5000; during the north-easterly storm of September 9th birds were seen closer inshore throughout the day, tearing past the bay low over the waves.

P. macroptera came in from the sea earlier than did *Puffinus* sp. The first birds were timed as arriving at sunset plus 23 - 28 minutes, and often circled round for a time before the final descent (unlike the shearwaters which appeared to fly in more directly to their point of landing). Departure took place about two hours before sunrise. For the first four nights (August 29 - September 1) incoming birds were very noisy; on August 29 - 30 calling continued through most of the night, but lessened progessively thereafter and by September 5th the volume of calling was greatly reduced. Our stay on the islands coincided with a waning moon (full moon August 26) so the light factor would not have affected the number of birds coming in from the sea. The progressive decrease in numbers banded at Rolypoly Bay (August 29th, 200; 31st, 165; September 3rd, 148; 4th, 110; 6th, 62) may indicate that with increasing age of the chicks decreasing numbers of adults came ashore on successive nights.

The call of the Grey-faced Petrel is well expressed by its Maori name Oi. In the early part of our stay calls were loud and long drawn out (oooo-ii) but became shorter as the time went on, and less noisy. The calls of incoming birds were answered from the burrows by softer "*oii*" notes and a variety of squeaks and creaks; as the days passed a number of the incoming birds modified their calls to something not very different from the normal response notes of birds already ashore.

P. macroptera moves less easily on land than do *Puffinus* sp., and is easier to catch for banding but capable of inflicting some damage to the hand of the catcher, if not grasped so that it cannot twist its neck around to peck. Less mobile than the smaller species, it often sits for a long time in one place, on the ground or on a rock, not necessarily near the entrance to a burrow. One bird sat still for 20 minutes apparently unworried by being twice approached to within three feet with torchlight and camera. The camp fire had an unfortunate attraction for one or two birds.

An attempt was made to estimate the *P. macroptera* population. A calculation based on the banding records from Rolypoly

Bay (estimated as 50% of the population of this well worked block) and on the estimated area of that block plus the areas of other blocks in which the number of burrows indicated a population of similar density, and making allowance for the population of scattered burrows in less favoured areas, gave an answer of c. 5000 pairs on Red Mercury. Comparative calculations made for Stanley, Korapuki and Double Islands, all of which have proportionately larger areas suitable for *P. macroptera* nesting, brought the total estimated population for the four islands to c. 13000 pairs.

WHITE-FACED STORM PETREL — About a dozen of these delightful little petrels were seen at sea in ones and twos, skimming just above the waves, banking steeply till one wing tip almost touched the water, then with a patter of feet and a little bounce swinging over as if to balance on the opposite wing tip. After dark on 2nd September c. 100 birds flew around the light of Mr. Butterworth's boat from which a party was fishing, off the west coast of Red Mercury. Falla (1934) records breeding at Mercury Islands, eggs in the last ten days of October.

DIVING PETREL — About a score were seen in ones and twos on the outward journey, flying with hurried wing beats, and diving. One bird which surfaced from a dive just ahead of the ship made a great effort to take off but apparently could not quite manage it in time so took avoiding action by diving again. A few birds were seen at sea between Red Mercury and Korapuki, and one flew to the light of Mr. Butterworth's boat on the night of 2nd September. Feathers attributed to this species were picked up on Korapuki and two birds which came ashore at Rolypoly Bay were seen in the beam of a torch but scuttled off before they could be caught. On Stanley Island a dead bird was picked up on the beach, and a colony of over 100 burrows was found on a steep grass/taupata/ice-plant slope just south of the eastern landing, the lowest burrows being about 30 ft. above high water mark; probably because of the very shallow soil layer many of the burrows had been constructed so that they lay parallel to the cliff face. Several burrows examined contained an egg; some burrows were open at both ends — when a hand was inserted at the entrance the sitting bird shot out at the exit.

GANNET — Numerous birds were seen offshore from Bush Island and Horuhoru gannetries and on the homeward voyage a string of birds flew along offshore from Coromandel Peninsula as if making for Mahuki; one bird was trailing a long piece of brown seaweed. Off Red Mercury from two to ten birds were seen almost daily, flying past the bay or fishing off shore.

BLACK SHAG — A single bird off Red Mercury, 5th September.

PIED SHAG — Sighted off Double Island, ten birds on a rock stack at Korapuki. Colonies at Stanley Island (four nests on pohutukawas at the foot of the western cliff, one probably still containing chicks as both parents set up a clamour when a Black-backed Gull flew past); Red Mercury western shore, five nests, one still occupied, in a pohutukawa grove a little way back from the boulder beach; Great Mercury (Peach Grove) 53 nests in seven pohutukawa trees

about 200 yards upstream; some well grown young had left the nest, nestlings were seen in all stages of growth, and a few nests probably still had eggs; the adults were surprisingly unafraid and allowed themselves to be approached and photographed at close range.

LITTLE SHAG — In the Peach Grove Pied Shag colony were also six White-throated and two Little Pied Shags, sitting alongside nests. They had apparently not yet laid, and were very wary. Only two sightings on the outer islands, probably the same bird, an immature in dark plumage which had wandered far from home.

GREY DUCK — Five seen at Great Mercury.

HARRIER — Three sightings of single birds on Red Mercury, one at Korapuki, two birds at Double and three birds at Stanley; three birds at Great Mercury. Two of the Stanley birds were uttering short calls and may have been courting. Harriers probably move about between the islands; on the outward passage a bird was seen flying from Great Barrier to the mainland.

VARIABLE OYSTERCATCHER — One bird at Peach Grove Beach on 11th September (C.G.C.).

BANDED DOTTEREL — Six birds at White Beach, Great Mercury.

NEW ZEALAND DOTTEREL — One pair at White Beach.

ARCTIC SKUA — Three dark phase birds chasing White-fronted Terns between Waiheke and the Noises, September 12th.

BLACK-BACKED GULL — Scattered throughout the islands in small numbers. No evidence of breeding, but probably individual pairs have established territory on all the islands, and we were told by J.B. that nests have been seen near the boulder beach on Double Island.

RED-BILLED GULL — Off Red Mercury the daily tally of birds fishing offshore varied from a dozen to 200, and parties were seen off Double and Korapuki. At Sheep Bay there is a bird with a club foot.

CASPIAN TERN — Odd birds seen off Red Mercury, Double, and Sheep Bay.

WHITE-FRONTED TERN — Large numbers in Hauraki Gulf on the return voyage, often with Fluttering Shearwaters; Great Mercury, parties of up to 40 birds seen offshore and a few birds on rocks at Long Beach; the only sightings at the outer islands were three birds off Red Mercury on 3rd and again on 10th September.

RED-FRONTED PARAKEET — Ranking third in order of abundance among land-birds on Red Mercury, after Bellbird and Grey Warbler, Parakeets were always first to announce their presence in the morning, chattering among the karo and pohutukawa trees just before sunrise. They were relatively more plentiful on the small but heavily wooded Korapuki and Double than on the larger Red Mercury and Stanley, where there are extensive areas of scrub; present but rather scarce on Great Mercury. Small flocks were seen on the outer islands but it seemed that pairing was starting; one dead bird was found.

MOREPORK — Probably about 5-6 pairs on Red Mercury. A bird seen on Double Island was sitting near what seemed to be a nest hole in a pohutukawa branch about 15 ft. above ground. In Red Mercury woods two Moreporks were perched just above the corpse of a Blackbird; after watching us for a minute or two first one, then the other, flew silently away in different directions; shortly afterwards one was heard calling (about 3 p.m.) as if to attract its mate. Although we did not see a Morepork on Korapuki we did find a dead Blackbird, partially plucked as was that mentioned above. Present on Great Mercury.

KINGFISHER — Present in small numbers on all islands visited.

SKYLARK — Absent from the outer islands. Individuals and a flock of 10 birds on Great Mercury, where it is common.

FANTAIL — Inquisitive and conspicuous in woods and scrub on all islands; frequently seen flycatching over the boulders at the edge of the tide. Two old nests were found.

GREY WARBLER — Singing freely, the first morning song starting after Parakeets and Bellbirds. Usual song was as around Auckland, with a "dropped" note between series of trills, but one of a pair which appeared to be courting uttered a quick succession of trills with short pauses between but omitting the "dropped" note.

SONG THRUSH — Present on Great Mercury in small numbers but apparently absent from the outer islands.

BLACKBIRD — Blackbirds on the outer islands were shy, and from the number of corpses found (5 on Red Mercury, one on Korapuki) appear to lead rather a hard life. Two corpses (one found at the entrance to a burrow) were more or less intact; one had the brains eaten, the others were partially plucked. Moreporks are probably partly responsible for the mortality. Two old nests were found, one with a parakeet feather in the construction; two fighting males at Sheep Bay, Great Mercury.

DUNNOCK — Song heard daily on Red Mercury, and Great Mercury: seen on Double Island.

BELLBIRD — The most common passerine on Red Mercury, relatively more numerous on Stanley, quite plentiful on Korapuki and Double, scarce on Great Mercury. On Red Mercury the poulation was not so dense as to produce a morning chorus, but two pairs around the camp provided good melody; most of the song was in modulated 4-7 note phrases. Birds were seen feeding on the flowers of kowhai and karo.

TUI — Only three birds sighted, but Tuis probably visit the islands when pohutukawas are in bloom.

WHITE-EYE — Small parties on the outer islands and a flock of 40+ on Great Mercury. Song heard at Red Mercury on 31st August; an old nest was found on Stanley. Birds were feeding on kowhai and ngaio.

LESSER REDPOLL — Two separate sightings on Great Mercury (R.B.S.).

CHAFFINCH — Birds seen on Red Mercury and Double Island, but no song heard. Common on Great Mercury, flocks of up to 15 birds.

YELLOWHAMMER — Common on Great Mercury (one flock of 23 birds) but not seen on outer islands.

SPARROW — None seen on outer islands; 15 in a flock at Great Mercury.

STARLING — Common on Great Mercury (one flock c. 50 birds); small parties on and around Double Island and Red Mercury, seven birds on the cliff at Stanley (according to J.B. much larger numbers are sometimes seen there). A good deal of movement takes place between the islands, and flocks of 30-40 birds were seen offshore on several occasions. One flock seen near Stanley included an albino bird. Some birds use the outer islands as a roost; one evening a flock of 40 flew along the south coast of Great Mercury heading for Red Mercury, and c. 20 were seen leaving the western shore of Red Mercury at first light on 30th August.

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EXTINCTION AND THE LAND AND FRESHWATER-INHABITING BIRDS OF NEW ZEALAND

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The depletion of New Zealand's avifauna since the first impact of European man on these islands is often cited as a melancholy example of the results to be expected from the ever-increasing effect of modern man upon natural ecosystems. But unfortunate though these results may have been, the degree to which they have hastened the extinction of various species is frequently overemphasised. Early local authors were understandably pessimistic at a time when rapid changes were occurring and wholesale exterminations seemed imminent (Buller 1873, 1888, 1905) and this mood has been echoed by many other authors since. Even the following cautious statement by Lack (1954: 202) seems to imply widespread extinction: "A casual impression would suggest that the native birds have been largely driven out by Palaearctic introductions." (It also implies a competition that has not yet been shown to occur, as does the comment by Hesse, Allee and Schmidt (1951: 113) that "the endemic birds of New Zealand give way before the buntings, starlings and goldfinches.") These statements no doubt originate from such influential local authorities as Buller (1905: xxxiii) and Oliver (1930). A healthy scepticism about such assumptions, for example that of Myers (1923) is seldom quoted. Great though the diminution in numbers has been since European settlement, only a few species have become totally extinct, in spite of the extensive changes that have taken place in the environment and in spite of the introduction and establishment of a comprehensive new fauna of mammals, birds and insects. The number of bird species dying out before 1800 far exceeds that vanishing since; though when