

AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITION



INTERIM REPORTS

4

Notes on the Fur Seals at Macquarie Island and
Heard Island

By

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AND HEARD ISLAND

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THE FUR SEALS AT MACQUARIE ISLAND.

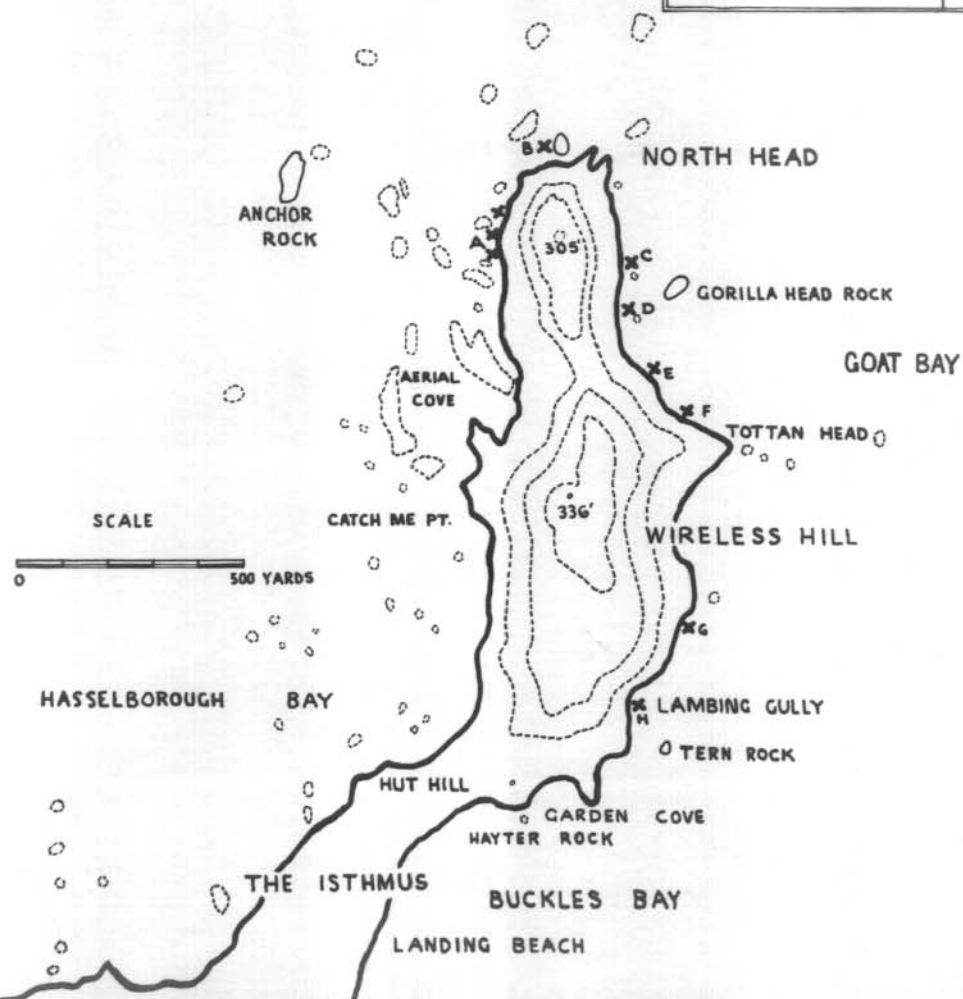
The fur seals of Australia and New Zealand are divided into three species: the New Zealand fur seal (Arctocephalus forsteri, Lesson); the South Australian fur seal (Arctocephalus doriferus, Wood-Jones); and the Tasmanian fur seal (Arctocephalus tasmanicus, Scott and Lord). It is probable that these three species are closely similar and no information exists as to the characters which distinguish one from another in the field^x. In spite of the hundreds of thousands of fur seals slaughtered on Macquarie Island by the early sealers, it seems that not a single skull or skin from Macquarie Island has been preserved in the museums of the world. From the point of view of fauna and flora, Macquarie Island is one of the subantarctic islands of New Zealand; one would therefore expect the fur seals at Macquarie Island to belong to the New Zealand species. This has now been established by Mr. Ellis Troughton of the Australian Museum, Sydney, who has identified a preserved specimen brought back from the island in 1951 by Shipp, A.N.A.R.E. biologist during that year.

Macquarie Island (Lat. $54\frac{1}{2}^{\circ}$ S., Long. 159° E) is a small subantarctic island approximately 600 miles from New Zealand, 800 miles from Tasmania and 800 miles from Antarctica. It is about 21 miles long and 2 miles wide, lying approximately in a north-south direction. Most of the island consists of a plateau about 1,000 feet high covered with tussock grass, moss, and other non-arboreal vegetation. Though the highlands are snow-covered during winter, no permanent snow exists on the island.

When Macquarie Island was first discovered in 1810, it supported a huge population of fur seals. The story of their destruction, which was accomplished within a few years, is told by Mawson (1943). When Bellingshausen (1831) visited Macquarie in 1820 he

x In April 1951 the writer and Kenny, A.N.A.R.E. biologist on Macquarie Island in 1948, spent an afternoon watching at close range a party of fur seals (Gypsophoca tasmanicus) at King Island in Bass Strait. Several were breeding adults and one of the cows was suckling a very lively pup. We agreed that they appeared decidedly larger than the Macquarie fur seals, but that otherwise there was no very obvious difference.

PRINCIPAL RESORTS OF FUR SEALS MACQUARIE ISLAND



Note: The names used on this map are provisional only
and subject to possible alteration at a later date.

reported that "the unbounded greed of the sealers had soon exterminated the fur seals" and that the only industry was then the production of oil from the elephant seals. The fur seals never recovered, for during the next hundred years any fur seal which strayed to Macquarie Island was shot on sight. In 1852 John Cook (MS), who spent four months on the island in charge of a sealing gang, wrote: "There is not such a thing as a fur seal on the island". Thirty years later Scott (1882) reported that "no fur seals are found on Macquarie Island, though they are so common on the Auckland group". In 1911 the sealers told members of the Australasian Antarctic Expedition that odd fur seals had appeared on the beaches on a number of occasions but, as Mawson observed, "Needless to say, they were killed forthwith". Apparently none was seen by the A.A.E. party which was stationed on the island from 1911-13. The fact that none was reported by the B.A.N.Z. Antarctic Research Expedition personnel at the beginning of December 1929 is of little significance, for even today one would be lucky to see any on a brief visit at that time of year.

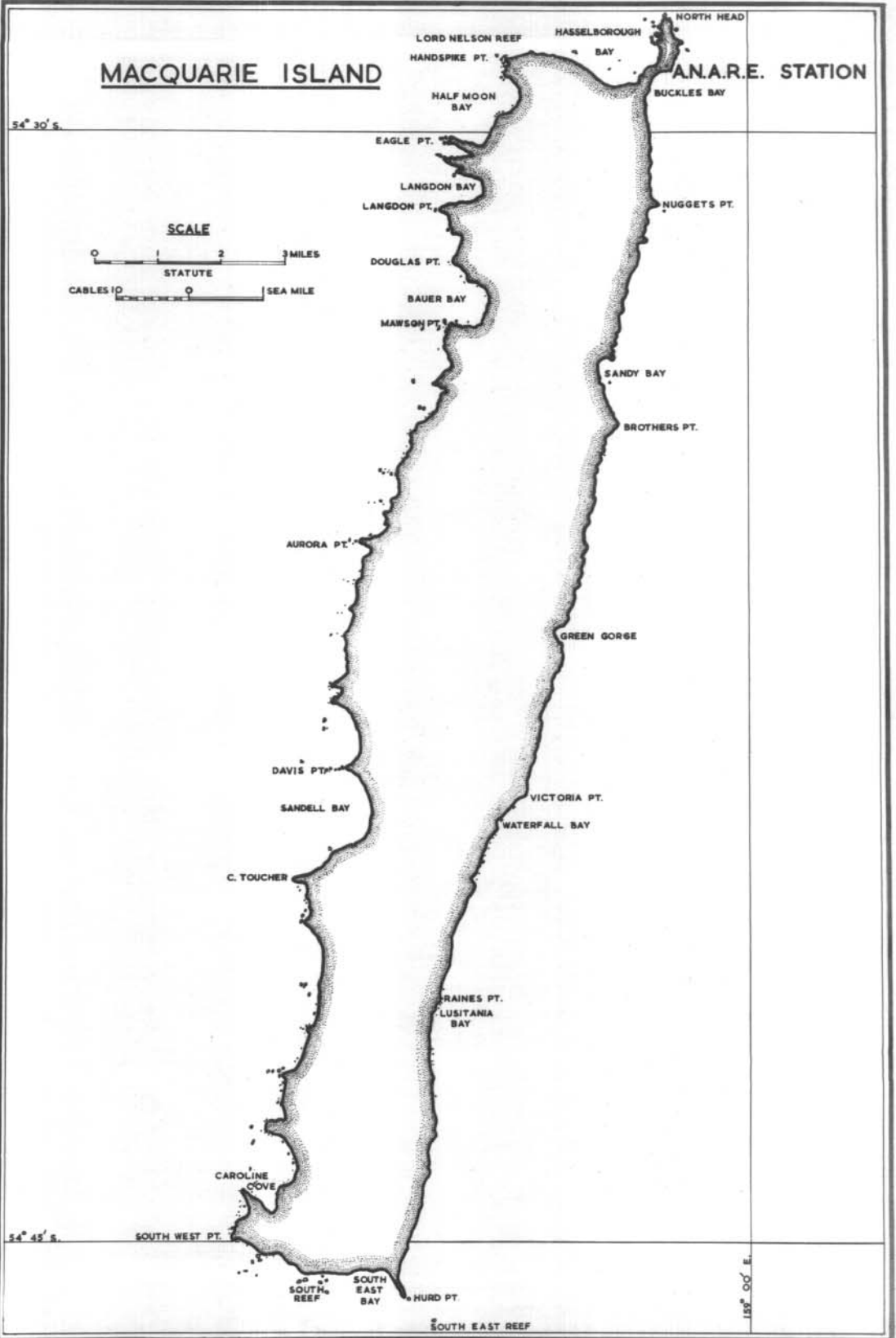
The following account is based on the work of Australian National Antarctic Research Expedition parties during their first two years at Macquarie Island (1948 and 1949). The writer, who was Medical Officer at the island during 1949, has drawn mainly on his own observations, supplemented by reports from other members of the party on journeys round the island.

PRESENT STATUS.

North Head on Macquarie Island is now visited annually after the breeding season by a small community of fur seals. From May 1949 to the end of March 1950 fur seal counts were carried out round North Head about twice a month. Only in the last month did this include a ledge on the west side of the large rock off the extreme point of North Head (See B on Map of North Head, Macquarie Island) which was a favoured spot at that time and no doubt would have sometimes repaid a visit even when few seals were present on the island. During the winter months the most likely places to find seals were :-

- (A) A rock shelter on the west side of North Head.
- (D) A shelter at the northern end of Goat Bay.
- (F) Some small caves on the north side of Tottan Head.

MACQUARIE ISLAND



From January to March other favoured spots were :

(E) An open beach which was unsuitable for sea elephants as there was a rock platform between the beach and the open sea.

(G) and (H) Points between Tottan Head and Lambing Gulley. Because of the inaccessible nature of this part of the coast it was rarely visited during the winter.

Outside this limited area fur seals were very rarely seen. On the west side of North Head they stopped abruptly at the line of rocks running out from the base of North Head towards Anchor Rock. None was ever seen on the rocks around Aerial Cove, nor on the west side of Wireless Hill. On 2 October, after the report of a pregnant seal there, the whole of the Eagle Peninsula was thoroughly searched and none was seen. In the middle of November, during a census of elephant seal pups around the entire coast of the island, not a single fur seal was seen, though on this occasion the rocky points on the west coast were not visited. In early January, during fifteen days spent by the writer and Dovers, A.N.A.R.E. surveyor in the southern part of the island, the only fur seal seen was one on rocks in Caroline Cove. On our return journey from this trip we covered the whole of the east coast from Hurd Point northward, with the exception of Brothers Point. The rocks south of Green Gorge and at Victoria Point seemed eminently suitable for fur seals, but none was there, though at this time they were beginning to return in some numbers to North Head. On 28 February, when the numbers at North Head were maximal, a search at West Point revealed none. On 3 March, a party following the coast round Brothers Point saw one. In 1948-49 the limitation of the fur seals to the north end of the island was equally noticeable. On 22-23 December Kenny followed the whole of the east coast from Hurd Point to Hut Hill and saw none.

The Macquarie Island fur seals showed a marked preference for rocky coasts, as the open beaches were usually occupied by elephant seals whose company they avoided.

The following table shows the numbers of fur seals recorded during 1949-50 at North Head, Macquarie Island :-

TABLE I. FUR SEAL COUNTS, MACQUARIE ISLAND, 1949-1950

Date	West Side of North Head	East Side of North Head	Total Number Observed
23. 4. 49	No observation	50	
30. 4. 49	12	No observation	
11. 5. 49	2	9	11
25. 5. 49	2	10	12
8. 6. 49	-	4	4
23. 6. 49	-	2	2
7. 7. 49	2	2	4
21. 7. 49	1	1	2
None recorded in five counts between 5 Aug. and 11 Sept.			
17. 9. 49	-	1	1
25. 9. 49	-	-	-
5. 10. 49	1	-	1
11. 11. 49	-	-	-
3. 12. 49	-	4	4
15. 12. 49	-	9	9
25. 12. 49	5	14	19
1. 1. 50	11	21	32
10. 1. 50	-	-	44
17. 1. 50	-	-	67
22. 1. 50	19	41	60
2. 2. 50	-	-	116
10. 2. 50	20	105	125
26. 2. 50	60	114	174
5. 3. 50	64	101	165
17. 3. 50	68	92	160
31. 3. 50	55	59	114

The highest count, on 26 February, was undoubtedly incomplete, as it did not include a visit to the foot of Lambing Gulley, where a small party was found on the next visit.

Accurate counting was not always easy, as the fur seals were very shy and generally made off to sea at the first sight of an intruder.

Though none was seen for a period of seven weeks from the end of July to the middle of September,



Plate 1. Fur Seals - North Head, Macquarie Island.



Plate 2. Yearling Fur Seal - Macquarie Island.

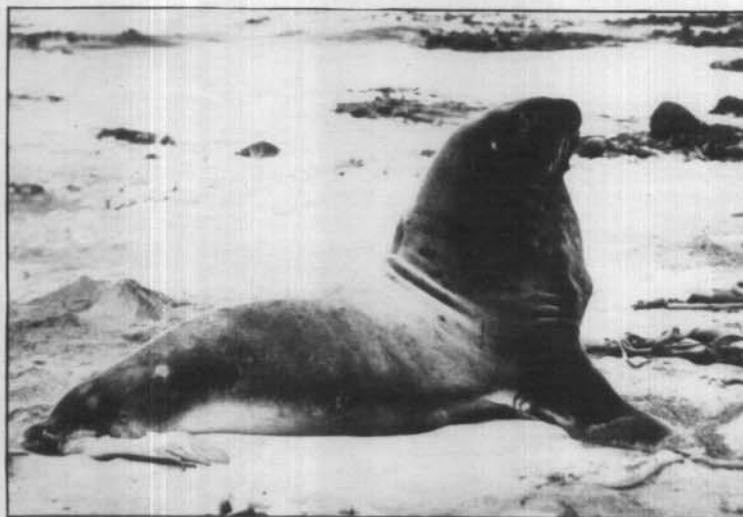


Plate 3. Hooker's Sea Lion ("Blackie") - Macquarie Island.

it is probable that occasional seals came ashore during the winter. Besides the one noted in Table I on 17 September, there were two (possibly three) other casual records in the same week. One of these was seen by Haysom and Manefield, A.N.A.R.E. biologists during 1950, at the base of the Eagle Peninsula. On account of its girth they considered that it was a pregnant female. These records might be interpreted as a sign that the seals were then looking for their breeding grounds. However, except for one on 5 October, no more were seen until December.

The first fur seals to return in December were probably adolescents. On 1 January the writer observed, "I have the impression that the first to return were mostly small animals, but today a large proportion of big animals (males ?) arrived - only two very small ones, each with or near a fairly small animal (female)". It was elsewhere noted that these very small animals had strikingly small heads, emphasised by the short coat and complete absence of any ruff, giving them a curiously otter-like appearance. These were at first assumed to be pups a few months old, but Dr. Falla, who very kindly read a draft of this paper, pointed out that they were yearlings, and supplied the following information, without which it would have been impossible to understand the significance of what was observed :-

"The breeding sequence (of *Arctocephalus forsteri*) is as follows : The bulls and cows come ashore in November. The pups are born from 5 to 25 December or thereabouts and remain ashore with their mothers till July or August. They are still being breast-fed at the end of July. Young seals entering their second year (i.e. yearlings) are quite small, and they and the two and three-year-olds haul out at any time of the year". - In 1949 the first of these yearlings was recorded on 3 December among the very first of the summering animals to appear. It was unattended, and looked about three feet long. The next note of yearlings is of two, each accompanied by a large animal, on 1 January. On 22 January there were again only two yearlings seen. However five weeks later the population included "a substantial proportion" of yearlings, some of them still associating with their mothers, others going about in small gangs. There was well-marked segregation of the different groups. The adolescents and adults were mainly to be seen lying out on the beaches or on the rocks along the shore. The gangs of yearlings lurked among boulders,

especially on the boulder slope opposite Gorilla Head Rock. If an intruder appeared, they would come scurrying out from caves and passages among the boulders and make for the sea. At one time there were over a score in this locality. The mothers with yearlings were nearly all in the cliff-bound embrasures on the north side of Tottan Head. On two occasions the writer spent some time watching them unobserved. While the young seals scrambled about exploring, each mother watched her young one, following it as soon as it moved out of sight. In 1949 this association of youngster and adult was observed as late as 23 April. However in 1950, on 31 March, only one such pair was noted and few youngsters were seen, suggesting that these are the first to leave. It would appear that most of the older animals remain till towards the end of April.

It is probable that the herd of fur seals now visiting Macquarie Island consists mainly of yearlings and adolescents, with a few non-breeding females still accompanied by their previous year's pups, and other non-breeding adults. They are in fact just those elements of the population which might be expected to leave their home shores while the rookeries are occupied by the breeding herds with the new season's pups. They probably come from Auckland Island, 400 miles north-east from Macquarie Island.

THE FUR SEALS AT HEARD ISLAND

The identity of this seal is problematical since the taxonomy of the fur seals of the South Indian Ocean has never been satisfactorily worked out and no specimens from Heard Island exist. It is probably the same species as that found on Iles de Kerguelen, Arctocephalus gazella, Peters (Turner, 1887). It differs markedly from the Australasian species. The most obvious difference is its more rounded head, which gives it an altogether stockier appearance. It is also a much less timid animal.

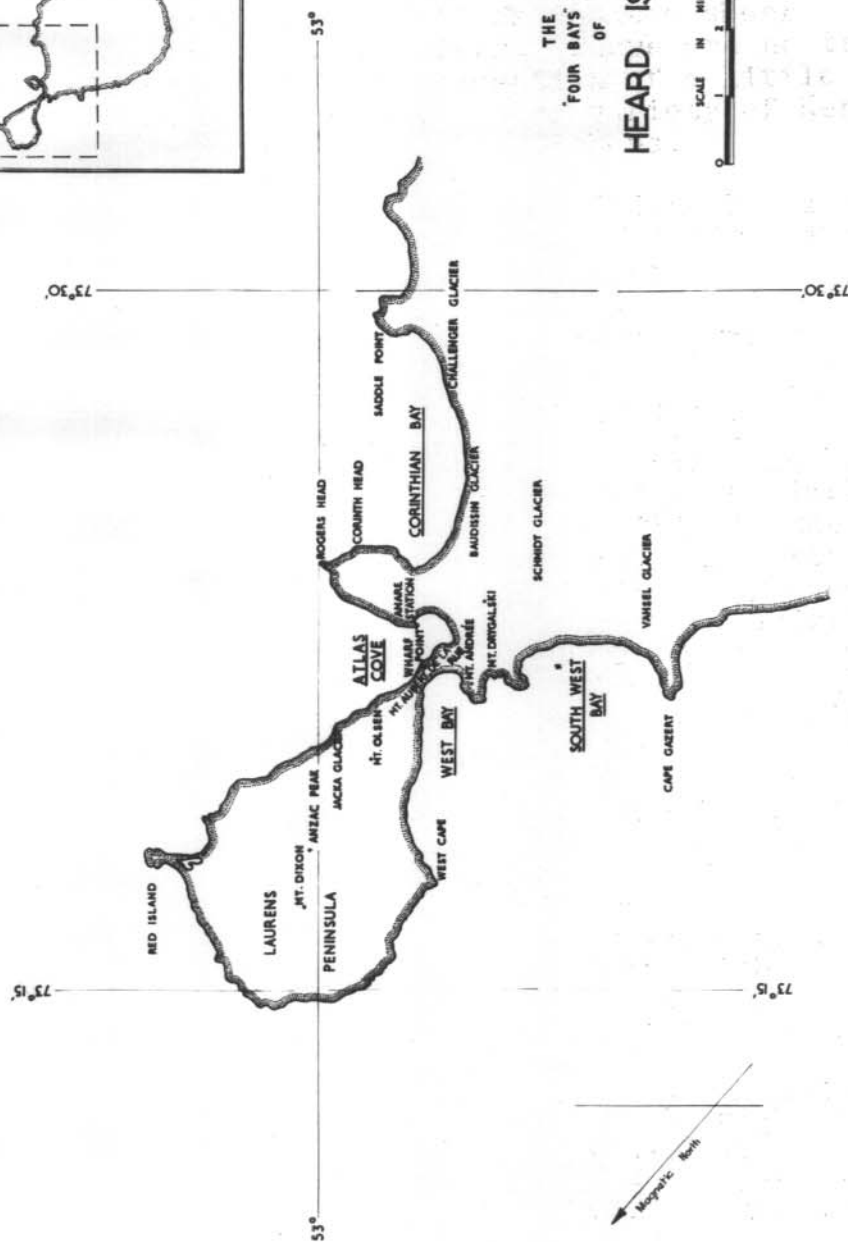
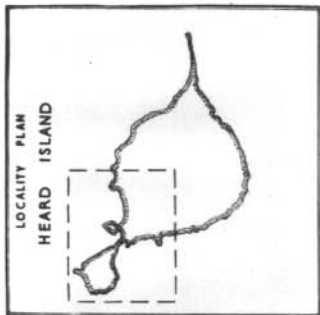
Heard Island (Lat. 53° S., Long. $73\frac{1}{2}^{\circ}$ E) is situated almost midway between South Africa and Australia, about 900 miles from Antarctica. The island is about 27 miles long and 13 miles wide, the bulk of it comprising the impressive mountain-mass of Big Ben (9005 feet). Permanent ice covers most of the island; the coast

consists of beaches, rock cliffs and the sheer terminal ice-fronts of glaciers. There are no trees and no vegetation with the exception of a little coarse tussock grass, some acaena, a poor variety of Kerguelen cabbage, and various mosses and lichens.

The early history of Heard Island has recently been summarised by Roberts (1950). The first recorded landing is that of Captain Darwin Rogers in 1855, and he and his successors visited the island primarily for elephant-seal oil (Lanman 1881). Lanman reports that "at one point, which he called the Seal Rookery, they slaughtered 500 of these animals, and.....thereby exterminated the race in that locality". As elsewhere Lanman uses "seals" to refer to fur seals, and "sea-elephants" when he means elephant seals, the implication is that they were fur seals. But as this is the only reference to fur seals in his account, and further on he states that the elephant seal is the only mammal on Heard Island, there is no evidence for the existence at Heard Island of the great herds of fur seals which were characteristic of so many of the subantarctic islands when they were first discovered. Possibly, with the more congenial shelter of Kerguelen so near at hand, the fur seals were never tempted to extend their range in any great numbers to the inhospitable shores of Heard Island. They are known to have been found on Kerguelen in vast numbers and, for an animal which suckles its young for several months, the milder climate of Kerguelen might be a real advantage. It is, of course, true that fur seals are established on such inhospitable shores as Bouvet Oya and the South Sandwich Islands but there they have no milder alternative.

Heard Island was not visited by any scientific party till the arrival of the "Challenger" in 1874. Moseley (1892) reports that at that time the foreman of the sealers said he had only one fur seal skin. Neither his party nor subsequent visitors saw any.

The following account is based on the work of Australian National Antarctic Research Expedition parties during their first three years at Heard Island (1948, 1949 and 1950). The writer, who was Medical Officer at the island from August 1950 to February 1951, has drawn extensively on notes by other observers, supplemented by some important data supplied by Brown and Downes, A.N.A.R.E. biologists during 1951.



PRESENT STATUS

Apart from a few sporadic records, all in late summer or autumn, the most important observations during 1948-49 were made by Dovers, A.N.A.R.E. surveyor, who afterwards spent some months on Macquarie Island, and so is familiar with both the Heard and Macquarie Island fur seals. He states : "When I left Saddle Point in early December there was no sign of any fur seals. However, about 8 January we returned to Saddle Point. About 20 January seven fur seals, all adults, arrived and took up quarters on the Mechanics Point side of the headland about half way up the tussocks from the beach. They proceeded to hunt off any sea elephants from a small area and even after being chased into the sea returned always to the same spot. There were some well marked wallows that they seemed to regard as personal property. They weren't shy like Macquarions but chased me more often than I chased them."

During autumn, 1949, Chittleborough and Ealey, A.N.A.R.E. biologists during that year, recorded only two in the area of the "Four Bays" (the area embracing Corinthian Bay, Atlas Cove, West Bay and South West Bay). One was observed near the Station on 29 March and the other, a larger animal at South West Bay, on 1 April. However, on 11 April, they found a group of ten on the tussock-covered flat at the foot of Red Island. These were recorded as "six yearlings and four adults", and it was the first record of fur seals in this area.

No more were seen until January 1950. The occurrences recorded by Chittleborough and Ealey and by their successors, Gibbney and Young, during 1950 appear in Table II. (See p.9).

The first occurrence in 1951 was a young animal seen on 15 January asleep on the sand at South West Bay. Another youngster was seen on 14 February among the tussocks above West Bay. These were probably yearlings and were the last recorded up to the time of the 1950 Heard Island party's departure on 17 February.

Up to this point little was known about their occurrence at parts of the island other than the "Four Bays". Spit Bay had been visited each year about the



Plate 4. Fur Seals - Red I., - Heard Island.



Plate 5. Yearling Fur Seal - Heard Island.



Plate 6. Bull Fur Seal - Heard Island.

beginning of November and none had been seen there, nor at Saddle Point, nor at any of the other beaches on the route. The five in February 1950 were seen during a brief landing at Spit Bay from the relief ship, so there is nothing to indicate what numbers frequent this area in the autumn.

TABLE II. OCCURRENCES OF FUR SEALS, HEARD ISLAND, 1950

Date	Locality	Number Observed
4. 1. 50	Saddle Point	0
27. 1. 50	Atlas Cove	2
30. 1. 50	South West Bay	1
12. 2. 50	Atlas Cove	1
19. 2. 50	Wharf Point	1
	West Bay	1
20. 2. 50	Spit Bay	5 (one yearling caught and measured - 4'6" long)
-3. 3. 50	Wharf Point	2 one yearling
31. 3. 50	Atlas Cove	1 small
11. 4. 50	West Bay	1
17. 5. 50	Wharf Point	1 large

After Chittleborough and Ealey's discovery of a group at Red Island, it was expected that they would be found breeding there. However, a visit to this area by Gibbney on 22 November 1950, and another by Young and the writer on 17 January 1951, drew a complete blank. It was not till the visit of Brown and Downes A.N.A.R.E. biologists during 1951 in March and April 1951 that the position became a little more clear. On 3 March they found 31 fur seals, with "only one larger than others, probably a bull". On 26 April they visited this locality again and found sixteen, including eight adolescents and one female followed by a yearling approximately four feet long.

From this it now appears that the position is very similar to that at Macquarie Island, namely that Heard is visited by bands of fur seals in the late summer and autumn, at a time when their home rookeries are occupied by the breeding animals and their pups. Unless there is some undiscovered

breeding place on the McDonald Islands there is little doubt that the fur seals seen at Heard Island are bands wandering south from Kerguelen; even in the days of their most rigorous persecution they were able to find sanctuary on the wild west coast of that archipelago (de la Rue 1930).

SUMMARY

An account is given of the present status of the fur seals at Macquarie and Heard Islands.

The fur seals at Macquarie Island belong to the species Arctocephalus forsteri, Lesson. These do not breed at Macquarie Island, but a herd of about 200 seals, consisting of yearlings and other non-breeding animals, hauls out at the northern tip of the island each year during the breeding season. No other part of the island is regularly visited by them, and even at the north end only occasional stragglers are seen between May and December.

The fur seals at Heard Island have not been specifically identified, but they probably belong to the same species as that found on Kerguelen, Arctocephalus gazella, Peters. They are found in small bands at various points on the coast during the months February to May. These bands include a number of yearlings, and their status appears to be similar to that of the Macquarie Island herd. No breeding places have been discovered on Heard Island and it is presumed that they are wanderers from breeding grounds on Kerguelen. Brief historical notes are included on each species.

APPENDIXTHE HOOKER'S SEA LION AT MACQUARIE ISLAND

In Australasian waters there are two species of sea lions, the South Australian sea lion (Neophoca cinerea, Peron), practically confined to the Australian Bight, and the Hooker's sea lion (Phocarctos hookeri, Gray) which breeds on the Snares, Campbell and Auckland Islands. There is no evidence that the latter was ever established as a breeding species on Macquarie Island, though in view of the extermination of the island's fur seals in the nineteenth century, one cannot say positively that sea lions never bred there. None of the previous reports on Macquarie Island, from Bellingshausen onwards, makes any mention of seals which could be identified with the present species.

However, several stragglers of Hooker's sea lion have been observed at Macquarie Island by the A.N.A.R.E. parties, and one individual appears to have established itself as a resident there for the past four years. Though the recorded occurrences could all be accounted for by three or four individuals, their feeding habits are such that they constitute a serious menace to the gentoo penguins on Macquarie Island.

No specimen of this species has been collected, but the individual with which this account is chiefly concerned is a young male, identified from photographs in "The Sub-Antarctic Islands of New Zealand" (Chilton, 1909). Figure 3, on p.545 in Vol. II of this work, would pass as an excellent photograph of this animal as it appeared in 1949.

The first recorded appearance of "Blackie" (as he came to be known) was on 18 January 1949, when Kenny reported seeing a "large ruffed dark seal on the Isthmus". He was first seen by the writer on 6 June when he was described as "larger than fur seals, standing well up on his hind flippers - was still wet, but appeared very dark, with suggestion of a grey-flecked mantle over head and shoulders". (See Plate 3). When wet from the sea he appeared black, but once when he was seen with his fur completely dry, it was noted that he looked much lighter than usual, and the chestnut fur around his tail and along the fold of his groins was conspicuous.

During June and July 1949, "Blackie" worked the beaches from Nuggets beach to the Isthmus. The gentoo penguins along this part of the coast became very harrassed, their numbers diminished, and their usual concentrations were broken up into small parties. Early in August it appeared that peace

had returned to this coast, and the gentoos were once more assembled in large parties on their favoured beaches. On 17 August "Blackie" was found operating on a beach south of Lusitania Bay. At the end of this month he was again at Middle Beach and continued to operate there till mid-September. On 11 November he was at work in Aerial Cove, and on 19 November was seen in Bauer Bay. On 17 January 1950 he was again in Aerial Cove. After that he was not seen for nearly three months until on 7 April he reappeared at the Landing Beach in Buckles Bay. Since his last appearance he had completed a moult and was now for the first time wearing a fine mane.

His appearances at a variety of different points around the coast in 1949 might be thought to suggest the existence of more than one animal; but his presence at distant points always corresponded with his absence from beaches near the Station, and it was easily known if he were working any particular beach, even when he was not to be seen, by the behaviour of the gentoos and by the penguin remains washed up along the shore. His appearance and habits, as well as the times at which he was seen in different places, all fit in with the theory that at this time there was only one animal.

In May 1950 he was seen several times, but his next recorded visit was not until November 1950, after which he was seen on several occasions up to the end of February 1951. During the tenure of the 1950 party, apart from one occurrence at Nuggets Beach, all recorded appearances were on beaches near the Station. There was no indication that more than one Hooker's sea lion frequented Macquarie Island in this period.

*

The first conclusive evidence of the existence of more than one Hooker's sea lion was furnished by Lindholm, A.N.A.R.E. biologist during 1951, who stated in his notes on the species :-

"On 18 May 1951 a black-haired seal was observed at Lusitania Bay. It appeared again twice in June. On 14 August Tindale, A.N.A.R.E. meteorological observer, had a rather interesting encounter with two sea lions. While walking along the beach at Hasselborough

* The 1948 party recorded several appearances of a brown sea lion. This was seen by the writer once, in April 1949, when it was lying up among the tussocks on the isthmus. It was very aggressive. This was most probably a female Hooker's sea lion. It was never seen again.

Bay he was followed for about 150 yards by a sea lion swimming in the shallows. Tindale happened to disturb a small sea elephant, which entered the water. This attracted the sea lion which intercepted the elephant seal and engaged it in a playful fight in the water.A little later he lost sight of them, but shortly after, two gentoo penguins emerged from the water pursued by a sea lion, which chased one of them about 50 yards in a semi-circle and caught it at the water's edge about 10 yards from where Tindale was standing. He ran towards the sea lion and hit it with a stone. It dropped the penguin (which was bleeding and appeared quite dead) and reared up on its forward flippers, snarling and standing its ground over the penguin. At this stage Tindale heard a noise from behind and swung round to see another sea lion charging out of the water towards him. He beat a hasty retreat up the beach, from where he watched the first seal pick up the penguin and both sea lions take to the water."

During the next three months single sea lions were seen on various occasions, and one of these (seen at North Head) was stated by Tindale to be smaller than those previously seen by him. This last specimen was seen to catch and eat three gentoo penguins in the water.

There were therefore at least two sea lions frequenting the north end of Macquarie Island during the latter months of 1951. One of these had heavy shoulders and a mane (perhaps the original "Blackie"), while the other was lightly built and without any discernible mane.

The Hooker's sea lion is a very aggressive animal. "Blackie" was once seen among a group of young elephant seal bulls engaged in their usual sparring matches, but though in an aggressive mood, he failed to attract any attention from the monsters towering above him. Another time "Blackie" was seen in a small harem, giving one of the pups a sharp nip. However, the mother was close by and for once he retreated. His most remarkable performance was that witnessed by Haysom in Bauer Bay, at a time when the elephant seal pups had left the harems and were gathered in large groups on the beach. On that occasion he was herding them like sheep, and was even seen to pick one up in his teeth and throw it over his shoulder. As pups at this stage weigh 400 to 500 lbs., this was a remarkable exhibition of strength.

"Blackie's" method of catching and eating his victims was observed on many occasions and was nearly always the same. He would patrol close in-shore till he spotted a penguin landing on the beach when he would come ashore after it. If the penguin turned for the sea before "Blackie" got close, the intended victim sometimes escaped, but more often the penguin fled up the beach. When it reached the steep slope at the top of the beach, it would turn in a half circle and make for the sea again. By this time both would be showing the effects of their efforts, but the penguin more so. Proceeding down the beach "Blackie" would slacken his pace to keep about ten feet behind his victim. When the penguin reached the water's edge, it would flop exhausted into a retreating wave and wait for the next to float it off. With a few quick bounds "Blackie" would reach his victim and seize it by the back of the neck. After a pause for breath, "Blackie" would then swim out to sea and there, with powerful jerks of his head, tear his victim to pieces, while the gulls gathered overhead for tid-bits. As a variant on this procedure, he would occasionally corner a mob of penguins among the boulders, grab one, and carry it off to sea. He was never seen to pay any attention to penguins in the water, even when they passed quite close to him. One always knew if "Blackie" had been operating on any particular beach by the remains washed up on the shore. These consisted usually of two parts, the wing girdle, complete with flippers, and the spinal column with head and feet attached. He was fastidious in his feeding, rejecting the bones and most of the skin, though on one occasion he was seen lying on the beach surrounded by bunches of feathers, as if he had been spewing them up.

Observations showed that all his victims were gentoo penguins. He was never seen at the crowded beaches near the royal penguin rookeries, although little was seen of his activities during the part of the year when they were ashore. King penguins are probably immune from his attacks, as the shores of Lusitania Bay are closely fringed with rocks and therefore unsuited to his method of hunting.

The use of penguins as a staple article of diet by sea lions at Macquarie Island is at variance with accounts of the normal feeding habits of this species, and is possible only because of the very small numbers of sea lions concerned. It is presumably adopted because they find it an easy way of getting a living. Were the sea lions to become established on Macquarie Island and this method of feeding to be generally adopted, it would almost certainly lead to the extermination of the gentoos on the coasts frequented by the sea lions.

At Auckland Island, Wilson (1907, p.65) stated, "The food of Hooker's sea lion in March appeared to consist exclusively of a large red crab....."; and Waite (in Chilton, 1909) reports that the stomachs of animals killed are found to contain fish and "nearly always, remains of the octopus."

ACKNOWLEDGEMENTS

The thanks of the writer are due to Dr. R.A. Falla for valuable information and comments on the first draft of this paper; to Mr. Brasenor of the National Museum, Melbourne, who first explained to the writer some of the difficulties which surround the taxonomy of the southern otariids; to Dr. F.C. Fraser of the British Museum for helpful guidance on the same subject; to Mr. Ellis Troughton of the Australian Museum, Sydney, for his identification of a specimen from Macquarie Island; finally to Dr. Colin Bertram, Director of the Scott Polar Research Institute, where the final draft of this paper was prepared, for the facilities the writer enjoyed and for much helpful advice.

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