

# ANTARCTIC PETRELS, SNOW PETRELS AND SOUTH POLAR SKUAS BREEDING IN THE THERON MOUNTAINS

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**ABSTRACT.** Observations made in the Theron Mountains in 1966-67 and 1967-68 revealed the presence of a large breeding colony of Antarctic petrels on Mount Faraway. This colony is only the ninth to have been discovered and it is probably the most southerly breeding area known for any bird species. Small numbers of snow petrels and south polar skuas were also breeding in the mountains.

**BREEDING** colonies of sea birds have now been discovered in several inland mountain ranges of continental Antarctica more than 100 km. from the coast. The first colony was discovered during the Norwegian-British-Swedish Antarctic Expedition, 1949-52, when O. Wilson found evidence of snow petrels (*Pagodroma nivea*) breeding 250 km. inland in Dronning Maud Land (Dalenius and Wilson, 1958). Since then, other snow petrel colonies up to 250 km. inland have been reported at about lat. 72°S., long. 10°E. in Dronning Maud Land (Løvenskjöld, 1960), in the Sør-Rondane mountains (Loy, 1962; Van Autenboer, 1962, 1964), in Tottanfjella and other parts of Heimefrontfjella (Bowra and others, 1966) and in the Beaver Lake area, Mac. Robertson Land (Brown, 1966), while large numbers of both snow and Antarctic petrels (*Thalassoica antarctica*) have been found breeding in Mühlig-Hofmannfjella (Konovalov, 1962; Konovalov and Shulyatin, 1964). Small numbers of south polar skuas (*Catharacta skua maccormicki*) were also breeding in most of these colonies and the petrel populations appeared to constitute their main source of food, judging from the numerous petrel carcasses present at these localities.

The Theron Mountains (lat. 79°S., long. 28°W.) are a remote and little-known range situated near the eastern margin of the Filchner Ice Shelf, 200-250 km. inland from the Weddell Sea coast (Fig. 1). The mountains were first visited in December 1956 by a survey party of the Trans-Antarctic Expedition, 1955-58, which reported snow petrels apparently breeding on Mount Faraway (Fuchs and Hillary, 1958). During the 1966-67 and 1967-68 summer seasons, British Antarctic Survey field parties visited the mountains and D. Brook found large numbers of Antarctic petrels, snow petrels and a few south polar skuas breeding. This paper describes observations made during visits to these colonies, the locations of which are shown in Fig. 2.



Fig. 1. Sketch map of Dronning Maud Land and the Weddell Sea area showing some of the mountain ranges mentioned in the text.

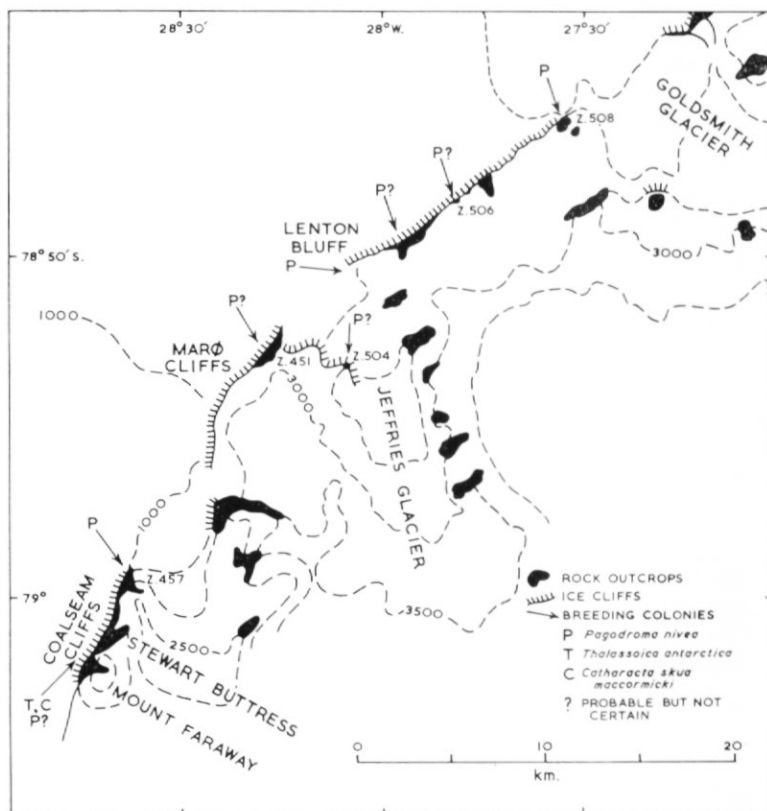


Fig. 2. Sketch map of the Theron Mountains indicating place-names mentioned in the text and the locations of the bird colonies. The form lines are at 500 ft. [152 m.] intervals.

The breeding population of Antarctic petrels is only the ninth to be reported from Antarctica, and the Mount Faraway colony at lat.  $79^{\circ}12'S$ . appears to be the most southerly breeding site yet known for any bird species.

#### ANTARCTIC PETREL

A flock of about 20 Antarctic petrels was seen flying southward on 12 October 1966, when the field party was about 90 km. south of the British Antarctic Survey station at Halley Bay (lat.  $75^{\circ}30'S$ ., long.  $26^{\circ}42'W$ .). During the remainder of the outward journey to the Theron Mountains, several other flocks were seen heading south, the largest ones in late October containing over 100 birds. When the party arrived in the mountains, large numbers of Antarctic petrels were seen on 28 November 1966 at station Z.457 but no evidence of breeding was found.

#### *Coalseam Cliffs colony*

On 6 January 1967, Coalseam Cliffs immediately below Stewart Buttress were visited and the large numbers of birds flying about the higher crags (Fig. 3) were found to be Antarctic petrels. Closer investigation revealed the presence of a large breeding colony about half-way up the cliffs. This colony was re-visited on 8 January, when further observations were made and photographs were taken (Fig. 4).

The colony is situated in a large scree-filled hollow between the two prominent 60 m. high dolerite cliffs of Stewart Buttress. A small dolerite sill about 3 m. thick runs almost to the centre of the hollow and the Antarctic petrel colony is concentrated at the foot of this cliff

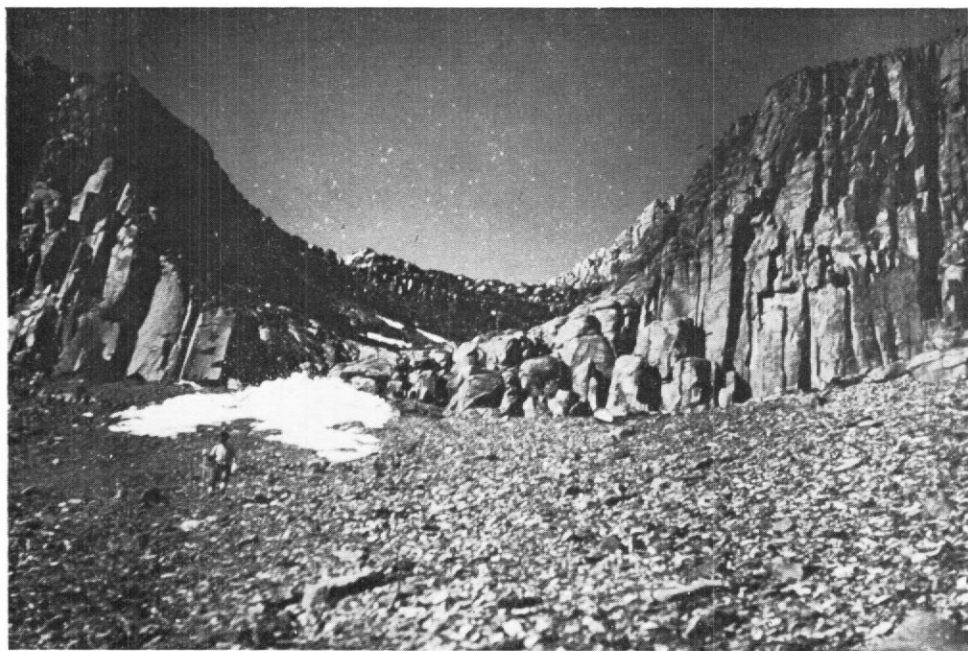


Fig. 3. The hollow below Stewart Butress. Note the large number of petrels in flight over the hollow.

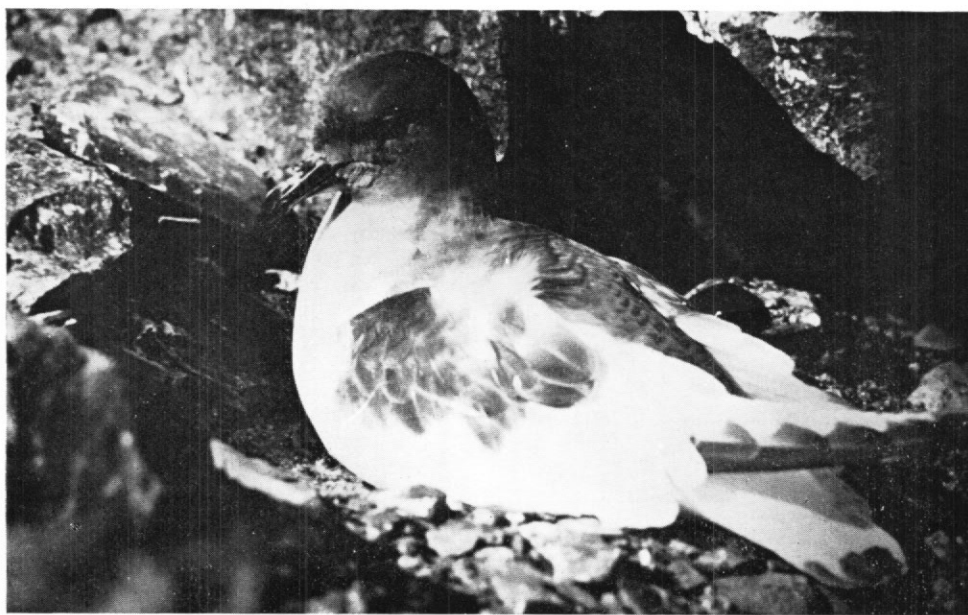


Fig. 4. Antarctic petrel (*Thalassoica antarctica*) incubating among dolerite boulders on Coalseam Cliffs.

among coarse scree and angular blocks of dolerite. The full extent of the colony is not known as only parts of it were visited but it is thought to cover an area of at least 200 m. by 30 m. Similarly, only a rough estimate of numbers can be given—the colony is considered to hold between 5,000 and 10,000 birds, which is equivalent to an average density of about one nest per m.<sup>2</sup>. The colony was closely packed with incubating birds nesting just out of pecking range of their neighbours. The nests consisted of little more than shallow scrapes in the rock debris. On 8 January 1967 the nests contained eggs and no chicks were seen.

Mortality of young appeared to be high since the lower scree slopes near the colony were littered with the remains of chicks together with a few adult birds. However, as most of these carcasses were fairly old and picked clean, and had evidently accumulated over a long period, annual losses could be quite small. Predation by skuas seems to be the most likely cause of death but it is not clear whether the skuas take live healthy young or merely scavenge on birds already moribund from other causes such as starvation.

The colony was not re-visited in 1966–67 or in 1967–68, although a number of birds was seen flying near Stewart Buttress on 10 November 1967. During the return journey from the mountains in early March 1967, occasional small flocks of Antarctic petrels were noted flying northward, and on 21 and 22 February 1968 N. Mathys observed two flocks of about 30 and 12 individuals heading north about 150 km. north of the Theron Mountains.

#### SNOW PETREL

Snow petrels were first seen in the Theron Mountains on 20 November 1966 in the vicinity of Lenton Bluff. Several further sightings were made but no colony was found until 8 December 1966 at station Z.508 (Fig. 2).

##### *Colony at station Z.508*

This colony was situated in and among blocks of weathered dolerite on top of the outcrop and also on a prominent ledge where rock had fallen from the cliff above. Nests were widely scattered and ranged in altitude between 580 and 670 m. a.s.l.; numbers were difficult to estimate but probably at least 50 pairs were present. Numerous other unoccupied sites were noted where thick deposits of guano and solidified oil indicated previous usage. Further visits were made to this colony on 25 January and 21 November 1967. Adult birds were present on their nests on each occasion but they were not closely examined. Remains of dead birds, mainly chicks, were noted in this colony. On 14 February 1968, N. Mathys again visited this area and found it relatively deserted, with only one or two snow petrels, including one large chick still in down, and one skua present.

##### *Other colonies*

Only two other definite colonies were found. On 16 December 1966, a small colony of between 10 and 20 pairs was found at an altitude of 450 m. a.s.l. on a small outcrop at the south-west end of Lenton Bluff, immediately north of the mouth of Jeffries Glacier. Nests were mainly limited to cracks and ledges in the dolerite. Another colony of similar size was found on 2 January 1967 at the extreme north-eastern end of Coalseam Cliffs near station Z.457 among large boulders resting on ledges of dolerite.

Other congregations of snow petrels indicative of breeding colonies were noted at the following sites but they were not investigated: Marø Cliffs near station Z.451, about 50 birds on 12 November 1967; near station Z.504, about 80–100 pairs on 16 November 1967; north-eastern end of Lenton Bluff, 18 November 1967; station Z.506, large numbers were present on 18 and 19 November 1967. All of these congregations were associated with high cliffs of dolerite.

#### SOUTH POLAR SKUA

On 10 November 1967, three pairs of skuas were present near Stewart Buttress and on 16 November a bird was seen around a camp site on Jeffries Glacier. Two skuas were flying among a large flock of Antarctic petrels at station Z.457 on 28 November 1966, and others were seen near Mount Faraway on 21 December 1966.

During the first week of January 1967, six pairs of skuas were counted defending territories in the extensive moraine area below Coalseam Cliffs. No nests were found but during the visit to the Antarctic petrel colony on 8 January 1967 one pair of skuas and a single half-grown chick were seen in the middle of the colony.

#### DISCUSSION

Although the observations described in this paper provide the first evidence that Antarctic petrels breed in the Theron Mountains, the presence of a colony there was suspected earlier by Thurston (1961, 1962). He reported regular movements of Antarctic petrels over the Halley Bay station and along the ice front at Halley Bay in two seasons and noted that the largest groups all headed west or south-west in the direction of the Theron Mountains. In 1960, he saw the first arrivals on 3 October, and on 11 October 250 birds were seen flying south-west in 3 hr. as if on migration. Other parties heading in the same direction were seen in November and December. In 1961, Thurston noted first arrivals on 15 October and a flock of 200–300 petrels, which were almost certainly *Thalassoica antarctica*, heading south-west on 19 November. Similar observations were also made in 1962 by Brown and Jarman (1962). Rather curiously, comparable movements of snow petrels have not been reported, while there is only one report of a movement by either species in the reverse direction—on 26 January 1962 (Brown and Jarman, 1962).

As already mentioned, only nine breeding colonies of Antarctic petrels are known; these are listed in Table I in order of their discovery. Another colony may exist on Mount Bischoe, Enderby Land (Mawson, 1915), but this has not been confirmed. Considering that the species is not uncommon in waters bordering continental Antarctica and that large areas of the continental coastline have now been explored, it is remarkable that so few colonies have been found. The inland location of three of the nine colonies (Rockefeller Mountains, Mühligh-Hofmannfjella and Theron Mountains) suggests, however, that other colonies may have escaped detection in the interior of the continent. In this connection, it is of some interest that 300–500 Antarctic petrels were observed on 9 October 1960 flying inland from the South African station SANAE (La Grange, 1962), while large numbers were reported arriving at Halley Bay, about 950 km. south-west of SANAE, just 48 hr. later (Thurston, 1961). As the numbers involved were similar and the distance between the two stations is approximately 2 days' flying time, both Thurston and La Grange considered that these flocks were identical. However, the breeding seasons of the fulmarine petrels are known to be extremely constant and synchronized in both space and time (e.g. Beck, 1970), and it seems equally probable that the flocks near SANAE on 9 October represented the spring influx either to the colony in Mühligh-Hofmannfjella or to an as yet undiscovered colony in the mountains of western Dronning Maud Land.

The greatest distance inland at which petrel colonies occur is presumably determined by the distance birds have to fly for feeding purposes, the amount of fasting the young can survive while the adults are away foraging at sea, and how quickly food is digested after capture as well as the availability of suitable nesting habitat inland. It is thus of interest that in the Shackleton Range, 150 km. south of the Theron Mountains, a few snow petrels were seen at lat. 80°S. by field survey parties in 1968–69 (Roberts, 1969) but no breeding colonies were seen. It appears that either suitable nesting sites are not available or this range lies too far inland for successful breeding to be possible.

#### ACKNOWLEDGEMENTS

We should like to thank N. Mathys for allowing us to use his notes made in the Theron Mountains and Shackleton Range in 1968–69 and one of the authors (D. B.) wishes to acknowledge the assistance and encouragement of his companions in the field. Dr. R. M. Laws and Mr. I. Prestt kindly read the manuscript and we are grateful for their helpful comments.

*MS. received 12 May 1970*

TABLE I. ANTARCTIC PETREL BREEDING LOCALITIES LISTED IN ORDER OF DISCOVERY

Date	Locality and population size	Expedition	References
28 November 1912	Haswell Island, Queen Mary Land (about 1,000 birds)	Australasian Antarctic Expedition, 1911-14	Mawson, 1915; Falla, 1937; Pryor, 1968—a recent account of the colony
22 December 1913	Cape Hunter, King George V Land (1,000s)	Australasian Antarctic Expedition, 1911-14	Mawson, 1915; Falla, 1937
13 January 1930	Proclamation Rock, Enderby Land (? size)	British-Australian-New Zealand Antarctic Research Expedition, 1929-31	Falla, 1937
13 February 1931	Scullin Monolith, Mac.Robertson Land (? 50 pairs)	British-Australian-New Zealand Antarctic Research Expedition, 1929-31; also <i>William Scoresby</i>	Falla, 1937; Rayner, 1940
18 December 1940	Mount Paterson, Rockefeller Mountains, King Edward VII Peninsula (abundant)	U.S. Antarctic Service Expedition, 1939-41	Perkins, 1945
January 1960	Mühlig-Hofmannfjella, Dronning Maud Land (1,000,000 birds)	Soviet Antarctic Expeditions	Konovalov, 1962; Konovalov and Shulyatin, 1964
February 1960	Lewis Island, Wilkes Land (about 10 pairs)	Australian National Antarctic Research Expeditions	Orton, 1968
January 1961	Windmill Islands (Ardery and Odbert Islands), Wilkes Land (50-100 pairs)	Australian National Antarctic Research Expeditions	Orton, 1963, 1968
6 January 1967	Coalseam Cliffs, Theron Mountains (5,000-10,000 birds)	British Antarctic Survey	This paper

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