

# Snowy Owls breeding in Shetland in 1967

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Photographs by Dennis Coultts, Eric Hosking and R. J. Tulloch

(Plates 13-19)

## INTRODUCTION

The nesting of a pair of Snowy Owls *Nyctea scandiaca* on Fetlar, Shetland, in 1967 was the first substantiated record in the wild in the British Isles. Publicity was inevitable and so the Royal Society for the Protection of Birds organised a round-the-clock watch until the young had flown. This paper is based on data in logbooks at the observation hut and on my own records.

Witherby *et al.* (1938-41) described the Snowy Owl as 'Almost regular winter-visitor to Shetlands and frequent Orkneys and Hebrides, often on mainland of Scotland and in Ireland' and listed over 30 records for England. Over twenty years later Hollom (1962) noted it as 'Now rare and irregular even in the north of Scotland'. During the five years 1958-62 the Rarities Committee accepted only four records, in Banff, Angus, Kincardine and Anglesey. In Ireland there were 50 records before 1950, but in the next 15 years only one (Ruttledge 1966). From 1963 onwards, however, British records became more frequent. In the four years 1963-66, quite apart from a number in Shetland, over 20 were accepted from 14 counties in Scotland and England. Some of the southerly ones may have been escapes, 'surprisingly large' numbers of this species having been imported in recent years (Harber 1966). On the other hand, Nagell and Frycklund (1965) have described a series of irruptions of Snowy Owls in Scandinavia in the winters of 1960-63, with a peak of 33 in January 1962 and breeding proved in six areas in summer 1960; they reported that many others were seen in Finland and Estonia, as well as four in Britain (two of those not in the reports of the Rarities Committee), five in Germany (three of them in the Friesian Islands) and three in the Netherlands. The fact of these irruptions just before the increase in British records seems significant.

Saxby (1874) stated that, from the time the first was shot on Unst in 1811, Snowy Owls were often recorded in Shetland, chiefly on Yell and Unst, though there might be several years without any reports and then a series with frequent occurrences. Saxby also mentioned two hearsay instances of Snowy Owls with well-fledged young on Unst. Venables and Venables (1955), however, noted that Snowy Owls had become 'exceedingly rare' on Unst by 1904 and they traced only about six records in Shetland in the next half century.

The recent history in Shetland may be summarised as follows. In

## BRITISH BIRDS

1963 single males, possibly the same individual, were seen on Fetlar and Mainland in June and July. In 1964 there were many reports of probably only one individual on Fetlar, Whalsay and Yell between February and November (not only June to October, as in Harber 1965). In 1965 the species was recorded in every month, chiefly on Fetlar, but also on Mainland, Unst, Yell, Whalsay and Fair Isle, and at least three separate males and one female were involved. In 1966 at least two males and a female were seen throughout the year on Fetlar, Yell and other islands, and this continued into 1967 until the nest was found on Fetlar in June.

### HABITAT AND NEST-SITE

The habitat, on the north side of Fetlar, was the 400-foot hill of Stakkaberg, with rocky outcrops and boulder-strewn slopes, mostly of serpentine. The vegetation there is rough grass and heath, with other such plants as purging flax *Linum catharticum*, slender St. John's wort *Hypericum pulchrum*, mountain cat's-foot *Antennaria dioica*, fir clubmoss *Lycopodium selago* and stiff sedge *Carex bigelowii*, the last at an unusually low altitude. The only higher part of the island is the 522-foot Vord Hill, a mile east of Stakkaberg, which is used extensively by wintering Snowy Owls.

The nest-site, although only a mile from the nearest occupied croft, was on the north slope of Stakkaberg and so invisible from the villages which are in the south of the island. This area is part of the common grazing and holds sheep and Shetland ponies seldom visited by the crofters. Between nest and sea lay the disused crofting township of Ruster, which is usually grazed by cattle and sheep. To the south of the nest-site, and to a lesser extent to the east and west as well, outcrops formed a natural amphitheatre of rock and provided some shelter from the prevailing winds; to the north the ground sloped steadily to the sea about half a mile away and looked across the four miles to Unst. The most obvious characteristics of the Stakkaberg area are little human interference, plentiful food, and a terrain of rocks and prostrate vegetation somewhat reminiscent of arctic tundra. These characteristics are combined in few other parts of Shetland.

The nest itself was a scrape in a patch of grass (to which dead grasses were added as incubation proceeded) on a sloping slab of rock. This slab was the shoulder of a rocky outcrop, the top of which was twelve feet above the nest. The incubating female had a commanding view all round except south (where a ridge of Stakkaberg limited it to 80-100 yards) and south-east (where the outcrop of which the nest-site was part restricted the range to only a few yards). These 'blind spots' were covered by the male from his look-outs at all times, except during the short periods when he was hunting.

## SNOWY OWLS BREEDING IN SHETLAND IN 1967

The term 'territory' is used in this paper to mean the area of about 200 acres in which the male hunted prey and reacted to human beings and large birds; these reactions were most intense around the nest-site in some 20 acres bounded by his look-outs.

### EGGS AND YOUNG

The clutch was seven rounded white eggs (plate 19a). Taking the incubation period as 33 days (Watson 1957: 437-439), the first egg was probably laid about 2nd June, although the nest was not found until the 5th when it contained two; there were three eggs on the 7th and four on the 8th. After that, eggs were laid at a little less than two-day intervals until the clutch was completed on 14th June. According to information summarised by Watson, most first eggs are laid in May, chiefly between 10th and 22nd in Canada, Alaska, Siberia and Scandinavia alike, over almost 30° latitude. The Fetlar clutch was on the late side, therefore, particularly in view of the southerly latitude.

Incubation probably began with the first egg and was evidently well under way when the clutch was only half complete. One egg (probably the sixth) failed to hatch and the average interval of hatching between the others was about 40 hours, judging from the few visits possible during this period:

- 5th July (18.47 hours): six eggs and one chick about 24 hours old
- 6th July (11.06 hours): six eggs and one chick
- 9th July (12.55 hours): four eggs and three chicks (youngest still wet)
- 11th July (16.07 hours): three eggs and four chicks
- 13th July (16.25 hours): two eggs (one chipping) and five chicks
- 16th July (16.15 hours): one egg (which failed to hatch) and six chicks

The third egg is the only one for which the incubation period is known and that took 33 days to hatch.

At hatching the chicks were unable to see or do more than cheep faintly and open their beaks weakly. After four days they could lift their heads, and around the ninth day their eyes were fully open and their movements more co-ordinated. The first down was white faintly suffused with cream (plate 19a), but the second down, acquired after 10-12 days, was dark grey (plate 19b). There were areas of blackish bare skin on the face and the soles of the feet, and a patch on the back of each intertarsal joint was also bare, but pinkish. The primaries and secondaries of the eldest chick were clearly sprouting at 16 days; by 30-32 days the wings and tail were quite well developed, the down seemed paler and browner in tone, and white feathers covered the bare skin of the face. The irides were a cold pale grey at first, but became golden-yellow like those of the adults by about 23 days.

As the female often sat with her back to the hut, we could not see whether feeding was taking place when, as frequently happened, she

poked about in the nest. For this reason, it was impossible to get any accurate idea of how often the chicks were fed or of the order of feeding. When the older ones were able to sit out alongside her (plate 13b), she often ignored their begging and fed the younger chicks still beneath her. Later, the older ones were usually fed first, but the others were given food regularly and selectively. There was no fighting or squabbling in the nest.

While in the nest, the chicks were usually fed by the female. As they grew larger, however, they would rush at the male when he arrived with prey and he would then give it to them. He also passed food directly to them, if the female was not at the nest when he arrived. The chicks begged by nibbling at the female's beak, and also at her breast, belly and even the leading edges of her wings. Once one took a beakful of feathers from one of her facial discs. The chicks first started to feed themselves off prey in the nest at about 23 days.

The chicks were seen preening from 18-20 days and mutual preening was also recorded several times. About this time, too, they started wing-stretching, head-scratching and head-bobbing. In wing-stretching, both wings would be stretched vertically over the back and then forward over the head to the fullest extent, or, alternatively, one wing at a time would be stretched backwards along the body and held like that for two or three seconds.

The chicks also started to move out of the nest at 18-20 days. All had left in little more than a week and they never voluntarily returned. Twice we took larger chicks back to the nest for photography while small ones were still in it, but, as soon as we had gone, they returned to the shelter of the rocks. Dispersal from the nest was spontaneous and individual chicks did not necessarily stay very close together, although they all moved off in an easterly direction. This took them away from the hut, but also towards the nearest outcrops of rock, beyond which lay the best part of the territory for their concealment. That was an area of rough grass profusely strewn with rocks and smaller stones, and there, about 250 yards from the nest, they remained until they were able to fly. Although they sometimes sat huddled together to await the arrival of a parent with food, they immediately scattered if one of the adults gave a warning call. Each would then squat with head low on the ground and remain still until it realised it had been seen. Then it would show a threat posture, raising the feathers of body and wings to give an almost circular outline (plate 18b) and hissing and snapping its beak. At the last moment it would turn and bound away with long ungainly strides and flapping wings.

The moss and lichen-spotted stones blended perfectly with the downy plumage of the chicks. Even after pinpointing them all through the telescope in the hut on several occasions, we never succeeded in

finding more than one to three of them on going straight to the area. Owing to this difficulty in locating them all after they left the nest, it was impossible to assess individual differences in the first plumage. This was roughly similar to that of the adult female in the amount and distribution of dark barring, but had a whiter background so that at a distance the young looked mottled grey rather than the female's mottled fawn. Up to the time the young flew, their plumage showed no distinctions which might indicate their sexes, and size variations were not reliable because of the age differences. Two of those which finally fledged appeared larger than the rest (though against the assumption that these were females was the fact that one of them was the whitest of all). Some of the young showed traces of down, particularly on the head and neck, up to about nine weeks.

When the young were nearly flying, they competed strongly for food and an adult arriving with prey would almost disappear under a mass of struggling bodies. The adults, especially the female, were seen to encourage the young to chase them for the food. The natural gaps in the sizes of the chicks were accentuated by the youngest's being something of a runt, and up to the dispersal from the nest it was still considerably smaller than the rest. All six chicks were last seen on 12th August, by which time the youngest was 28-30 days old, and only five were known to reach the flying stage. The first flight was recorded at about 35 days (assuming that it was made by the eldest), but this was only for a few yards in a strong wind. The first sustained flight was at 43 days over at least 50-60 yards (after which the young owl was out of sight). All the five successful young could fly strongly at 50 days. In the early stages the younger chicks had seemed to lag behind in development, but they gradually made this up and after about 50 days any differences were hardly noticeable.

When the young could fly, they stayed loosely together and wandered over an area of more than a mile from the nest (occasionally including the vicinity of the nest itself), but up to the end of September they were still having prey brought to them by the adults. Although they were seen in hunting flight, including hovering, there was no evidence of their having actually caught any food themselves by this time. Yet on 11th October I saw one of the brood on the Out-Skerries, some 15 miles to the south. Single Snowy Owls were also reported from Unst, Yell and Whalsay during October and, by the descriptions of plumage and behaviour, these could have been young.

On 23rd November I found two young near the nest. The adult male was near-by and the young did not follow him when he flew off to about half a mile. The young allowed me within about 50 yards, and were as different in size as the adult male and female. The smaller, presumably a male, was closely barred with dark brown on what

appeared to be a white ground, except that the face, sides of neck and upper breast were pure white in a deep vee down the front. This bird looked smart and compact, while the larger one had a much dingier face and front and less closely-knit plumage.

On 9th February 1968 I saw four juveniles—two males and two females—on Stakkaberg, together with an adult male which was not the male of the breeding pair, since he had more spotting on his plumage.

## HUNTING AND FEEDING

When hunting, the male Snowy Owl usually flew low over the ground with deep wing-beats and frequent long glides. His flight appeared deceptively slow, but he could overtake Great Skuas *Stercorarius skua* (plate 17a) and large waders with apparent ease. Both male and female rarely flew higher than 50-100 feet and then only to challenge such big birds as Great Black-backed Gulls *Larus marinus* passing over the territory. While hunting, the male would perch for long periods on low ground, fence posts or ruined buildings, evidently waiting for prey to move. Most hunting was done in the early morning and late evening, and during the day the male used a series of favourite perches within about 200 yards of the nest, all with a commanding view.

Only three species were regularly caught and, in order of frequency, these were Rabbits *Oryctolagus cuniculus*, Oystercatchers *Haematopus ostralegus* and Arctic Skuas *Stercorarius parasiticus*. Adults and juveniles of all three were taken, most of the juvenile Oystercatchers and Arctic Skuas being caught when fully grown, but not yet able to fly strongly. Once we found the remains of ten Arctic Skuas, four of them adults, but this was when the nights were getting quite dark (and the young owls were nearing the flying stage) and we assumed that the adult skuas were probably caught on the ground while roosting. Other birds taken occasionally were (usually adult) Rock Doves *Columba livia*, Common Terns *Sterna hirundo*, Lapwings *Vanellus vanellus*, Redshanks *Tringa totanus*, Whimbrels *Numenius phaeopus*, Snipe *Gallinago gallinago* and Skylarks *Alauda arvensis*. Mice (probably Shetland Field Mice *Apodemus sylvaticus fridariensis*) were sometimes brought to the nest.

The male appeared to have no difficulty in obtaining enough food. Even when the young were fledging, he spent by far the greater part of each day resting and some prey remained at food depots until it became rotten. These depots were all within about 200 yards of the nest and the male often left surplus prey at them, particularly when the female refused it at the nest. The female also frequently took surplus food from the nest and deposited it at one or other of the depots.

The female was once seen to eat a Rabbit whole and the young in the nest often swallowed surprisingly large pieces of food. A chick still

in down swallowed the hind leg of a Rabbit so that the foot stuck out of its beak for some minutes afterwards. The female frequently ate the fore-parts of a Rabbit before bringing the rest to the chicks. She often picked up and dropped prey before eating it or stretched up her head and stared down intently at it. Both adults and young ejected pellets with a characteristic upward stretch of the neck; sometimes this was accompanied by scratching the throat with one foot, but on other occasions the pellets were ejected with a minimum of effort. On at least one occasion the female was seen to feed an already ejected pellet to a chick (plate 15b).

Drinking was never observed, although on one very wet day the female appeared to sip water running down her face. During the fledging of the young her face and under-parts became soiled with blood from the prey (plate 14b), but neither of the adults was recorded bathing, although two male Snowy Owls which summered on Whalsay in 1965 bathed frequently, especially while moulting in late July.

#### RELATIONS WITH OTHER BIRDS AND MAMMALS

Several species of birds were nesting quite close to the owls, including Golden Plovers *Pluvialis apricaria*, Ringed Plovers *Charadrius hiaticula*, Wheatears *Oenanthe oenanthe*, Meadow Pipits *Anthus pratensis* and Starlings *Sturnus vulgaris* within the breeding territory, and Oystercatchers, Whimbrels, Arctic Skuas and Skylarks on the other side of the rocky outcrops behind the nest. The smaller birds mostly ignored the owls (a young Wheatear once sat within two feet of the female feeding a chick), but even they became agitated at times and the owls were mobbed on occasion by all species nesting in the area. They were also mobbed by passing birds, including Fulmars *Fulmarus glacialis*, Lapwings, Curlews *Numenius arquata*, Great Skuas (plate 17a), Great Black-backed Gulls, Lesser Black-backed Gulls *L. fuscus*, Herring Gulls *L. argentatus*, Common Gulls *L. canus*, Black-headed Gulls *L. ridibundus*, Common Terns, Arctic Terns *Sterna paradisaea*, Ravens *Corvus corax* and Hooded Crows *C. corone cornix*, in addition to the species already mentioned, and a Merlin *Falco columbarius* was once seen hovering over the head of the female on the nest. The owls were most often mobbed in flight, the male quite often at rest, and the incubating female less frequently.

The Snowy Owls normally showed little interest in other birds except those which they took while hunting. In the earlier stages of nesting, however, such larger species as Great Black-backed and Herring Gulls, Ravens and Hooded Crows were challenged and driven off by the male. A party of up to six Hooded Crows regularly scavenged the area and were able consistently to outwit the owls, which harried them to little avail. These crows took quite a lot of prey from the

owls' food depots. When the young owls were well-fledged, they sometimes chased Hooded Crows away from prey. Of the birds which mobbed the owls, only those which dived closely, such as the terns and Arctic Skuas, achieved any reaction. Each dive would cause the owl to duck and sometimes gape upwards, while in the face of persistent attacks the male would often move from an exposed perch to the shelter of a rock.

Rabbits showed little or no awareness of the owls. Shetland sheep and ponies often wandered through the territory and likewise ignored the owls except when they grazed too close to the nest and were threatened by the adults, which sometimes even dived at them. Once the male threatened a group of sheep, one of which simply walked up and outstared him from only a foot or so away. On another occasion a young sheep playfully butted one of the young owls around until it eventually knocked it over; the female threatened, but made no attempt to attack. In the early stages of egg-laying a dog was attacked and driven off.

#### REACTIONS TO MAN

The reactions of breeding Snowy Owls to man vary considerably from place to place, among individual pairs and birds, and at different stages of the breeding season (Watson 1957: 424-426). Outside the breeding season, those in Shetland since 1963 have been fairly consistent in allowing the approach of human beings to within 50-100 yards and then unhurriedly flying away, usually no farther than necessary, to another suitable perch. In attempting to photograph them, we have found them exceedingly alert, their keen sight and hearing enabling them to detect the stealthiest approach.

With the start of egg-laying the behaviour changed. When Mrs. Ann Thomason passed through the territory at about the time of the first egg, the male settled some 30 yards from her; there he tore up the grass and, apparently, also small feathers from his legs, which she saw drifting away in the wind. In the early stages of egg-laying it became impossible to overlook the sitting female without alerting the male at the far side of the territory. On these occasions, too, even though one had approached silently and observed only through a small aperture between some piled stones nearly 100 yards from the nest, the sitting female would become aware of one the first time she looked that way. She would stare intently for a few seconds and leave the nest in the opposite direction, gliding low downhill for about 200 yards to alight on one of the look-outs used by both birds near the edge of the territory. The male would then usually fly to where he could see the intruder and there begin his aggressive barking (plate 13a and see VOICE).

If the intruder approached the nest itself, the male would become more agitated: he would fly from rock to rock, barking both while perched and in flight, and would sometimes land on low ground to show a threat posture (see OTHER BEHAVIOUR). When the intruder arrived at the nest, the male might dive within a foot or so of the person's head or show threat as close as 60-70 feet. If the intruder remained at the nest for more than a minute or two, however, the male usually retired to 30-40 yards and continued barking. This behaviour was most intense and the attacks most persistent when only one person approached the nest. As Watson (1957: 426) also found, the more people there were, the less aggressive the male was. The female generally behaved in a similar manner, but always farther away: she usually barked from 150-200 yards, but occasionally flew to within about half that distance, landed on the grass and showed distraction or threat (plate 18a) with a squealing accompaniment.

When the intruder or intruders left the nest, the male usually followed to the edge of the territory, then occasionally flew back to the female with a special flight to perform displacement coition (see OTHER BEHAVIOUR). The female generally returned to the nest before the intruder had gone more than 200 yards. On landing beside it, she usually looked at the eggs or young for a few seconds and then flew off, coming back a minute or two later to settle down. Occasionally, however, she would incubate briefly on the first visit or even stay on the nest. Sometimes, after a short visit, she would fly to one of the look-outs and preen for five minutes. All this behaviour was at its most intense around hatching and when the young were in the nest. At these times the male occasionally showed displacement hunting (see OTHER BEHAVIOUR) and the female once or twice made as if to dive at the intruder. She sometimes even showed distraction behaviour at 50 yards.

We seldom disturbed the young from the time they left the nest until they could fly. During three visits in a week when they were 28-46 days old, however, I found that the adults, particularly the female, were even bolder in defence than previously. The young were now squatting singly over a distance of 100 yards, about 250 yards east of the nest. When I approached any of them, the adults persistently dived so closely that I was sometimes touched by a wing. During these attacks both adults rattled their beaks loudly as they dived. Sometimes the male landed on a rock only 40-50 feet away, to bark and stare with lowered head while the female showed a distraction or threat display, lurching towards me with feathers raised and wings trailing until no more than 50-60 feet away (plate 18a). After the young had started to fly and, still loosely together, were ranging up to a mile from the nest, the adults showed less aggression or displacement activity. Yet

both would still bark at an intruder approaching the chicks, more persistently if this was near the old nest.

The observation hut was erected about the time egg-laying was completed, about 300 yards north-west of the nest and at the same level. After the young had hatched, it was moved farther south, about 150 yards from the nest. Each site happened to be near one of the male's look-outs and he immediately vacated that part of his territory, rarely using a perch nearer than 100 yards from the hut. Owing to the contours of the ground, this meant that watchers and visitors could enter and leave without either of the owls being aware of them. The owls showed no other reaction to the hut in either position, or to a hide which was later erected 40 feet from the nest, unless there was some sudden noise. Even then the female was rarely alarmed enough to leave the nest unless she saw somebody. When a camera was first used in the hide, she was obviously startled by the shutter and stared at the lens (plate 16), but later she completely ignored photographic work and would half close her eyes (plate 13b) before looking away with an almost 'disdainful' toss of her head. At no time did the male appear to take any notice of the hide.

## VOICE

Outside the breeding season Snowy Owls are said to be silent. In Shetland I have never heard any kind of call away from the nesting area. Saxby (1874), however, recorded that the species is 'sometimes heard screaming while following its prey' and that he once (2nd November) heard one make a 'rapid chirping noise which must have been pretty loud for I heard it distinctly, though at a distance of more than a hundred yards'.

The Fetlar pair were very vocal, particularly if disturbed, but also in greeting and other ceremonies. The usual call of the male was a loud, harsh, grating bark, which I noted as *ergh-ergh-ergh*, while the female had a higher pitched *eergh-eergh-eergh*. This is probably the same call as that quoted by Witherby *et al.* (1938-41) as *rick, rick, rick* and by Watson (1957: 421) as *kre, kre, kre, kre, kre*, though there may be some individual variation. The male would usually begin calling (plate 13a), in sequences of three to six barks, whenever an intruder entered the breeding area and would continue until the disturbance had passed. After leaving the nest on these occasions, the female would echo the male, usually from further away. She also had a variety of mewing, squealing calls which she uttered in such moments of tension or excitement as distraction/threat postures or the approach of the male with food. When the male was presenting food to the female, both would continuously utter guttural clucking and croaking noises. The female also used a version of this clucking when encouraging the

young to feed and then sounded almost exactly like a broody hen.

The male often hooted a low, deep, rough *hoorb*. Also recorded was a sound resembling the *aaow* of a Great Black-backed Gull. Hooting occurred during display flights and sometimes from the ground during distraction/threat posturing, but occasionally it seemed spontaneous. I once saw the male hooting from a perch, facing towards the nest, each hoot accompanied by a bowing of the head and repeated at three- or four-second intervals for about five minutes.

The hunger call of the young was a high-pitched, penetrating, whistling squeal, first noted when they were a little over a week old. They were still using it when they had been flying for over a month, by which time they could be heard over a mile away. When very small, the chicks uttered a faint cheeping sound and later snapped their bills when they were being handled.

#### OTHER BEHAVIOUR

##### *Threat postures*

The male would face an intruder and lower the front part of his body and head, glaring with wide open eyes (plate 17b); sometimes, too, he would raise his body feathers and partly open his wings. If starting to threaten at a distance, he on occasion rushed forward in this position, or even with his wings more fully extended and arched so that the tips dragged on the ground. This posture in its simple form was seldom used by the female, but appeared to be part of her distraction display (plate 18a). Watson (1957: 427) stated that the male's ground-hooting is also a form of threat and, on the few occasions that I witnessed it, the posture was certainly similar, with the bird ducking low at each hoot.

The young used an exaggerated threat posture when approached, raising their body feathers and wings to make themselves look huge (plate 18b). They then went over on to their backs and showed their talons (sometimes striking rather ineffectually with them) and gaped, hissed, and snapped their beaks.

##### *Distraction displays*

Both sexes frequently used distraction displays when disturbed. These were not always readily distinguishable from threat postures, which at times formed part of them. The female, however, also showed 'injury-flight', thrashing about on the ground with wings spread, twisting and dragging (remarkably like the injury-flight of an Arctic Skua), and uttering a squealing note (also not unlike an Arctic Skua). During one excited demonstration, when the young were almost ready to fly, she ended by rushing towards me, taking off and flying straight at my head, veering aside only at the last moment.

*Displacement activities*

Displacement coition was observed only in the early stages of incubation and seldom after completion of the clutch. It normally took place after a disturbance. Having seen an intruder off the territory, the male would fly back to the female, usually with exaggerated wing-beats, especially on the up-stroke, so that his body went markedly up and down at each beat; on the up-stroke the wings were momentarily held almost vertically. Upon his approach, the female would adopt the pre-copulatory posture, squatting with scapulars and tail raised. The male would then alight on her back and appear to copulate, though it was never confirmed that actual mating took place. Normal coition was also observed several times from the observation hut before the eggs hatched.

Displacement feeding similar to that recorded by Watson (1957: 429) was noted on many occasions, but only when the male took up a threat posture near the nest. He would tear vigorously at the grass and earth and then throw it away by shaking his head violently. This displacement feeding was often accompanied by swaying from side to side as he 'marked time' with his feet.

Displacement hunting occurred frequently when an intruder was near the nest and seems to have been noted more often than it was by Watson (1957: 429). The male hovered over the intruder with wings beating slowly and head lowered, looking, as Watson remarked, 'like a great white kestrel'. Similar behaviour is part of normal hunting.

*Behaviour during incubation*

Only the female incubated the eggs and brooded the young, leaving the nest at intervals to preen, defaecate or eject pellets. During incubation she rarely spent more than five minutes away, but, after the young hatched, her absences gradually became longer. Even so, she did not start hunting until the young were almost ready to fly at about five weeks. Until then she fed on prey brought by the male, either direct to the nest or left at the food depots.

The female did not seem to have any special position for incubating or brooding and was not even greatly influenced by the weather, although she often sat with her back to the wind. During sunny weather, but also occasionally when it was cool, she would frequently sit with her head pointing upwards and pant, her beak opened and her throat visibly pulsating. She often turned the eggs, settling down afterwards with a characteristic shuffling movement.

*Nest sanitation*

No attempt at nest sanitation by the female was recorded. During the hatching period, half of the shell from a hatched egg was found fitted

tightly over the end of one of the others which had still to hatch. Nevertheless, the nest remained clean until the young hatched, the female always flying off some distance to defaecate or eject pellets. After the hatch, it rapidly became an evil-smelling mass of dead vegetation, prey remains and the faeces and pellets of the young, all buzzing with flies.

#### *Food begging and giving*

Both female and young begged in a similar manner. The head was lowered and swayed from side to side, slowly at first and then increasing in speed as the male approached with food. The behaviour terminated in the bird's straightening up and often beating its wings. The male also frequently beat his wings as he transferred prey to the female or young.

Food was usually carried to the nest in both feet, Rabbits being gripped at the shoulders (less frequently with one foot at the shoulders and the other at the tail end). Unless the prey was quite large, the male would transfer it to his bill before offering it to the female who would accept it with much clucking and with the tail and scapular feathers raised in a manner similar to that of the pre-copulatory posture. Sometimes, however, she would be unwilling to accept the food, whereupon the male would often rub her face and breast with it while she closed her eyes and moved her head from side to side. If, after this performance, she was still unwilling to take it, the male would usually fly away with it and either eat all or part of it at a perch near-by or leave it at one of the food depots.

#### *Head swaying*

Head swaying was fairly common in various situations, mostly of excitement. It was used by both female and young during food begging; by the female towards the hide and towards the male on a perch; and by the perched male towards the nest and towards intruders. Watson (1957: 430) recorded it both before and after coition.

#### *Preening*

Both adults preened frequently, especially after rain or prolonged mist. The female preened both on and off the nest and was seen deliberately to eat some of her feathers on several occasions. Both adults often scratched their heads vigorously and the female in particular stretched her wings when off the nest.

#### ACKNOWLEDGEMENTS

I am greatly indebted to Keith Hague, who was in charge of the watch on the Snowy Owls for much of the season, for preparing a

## BRITISH BIRDS

summary which formed the foundation of this paper. Many other observers were involved and made detailed entries in the logbooks: there is not space here to mention more than a few by name, but I should particularly thank Timothy Gibson, Julian Knowles, Lieutenant-Colonel J. K. Stanford, Alex Temple and Jeremy Woodward, as well as the British Girls Exploring Society, all of whom played a large part. James Ferguson-Lees had to go far beyond the normal call of editorial duty to put this paper into a publishable form. The Snowy Owls themselves owe much to the Royal Society for the Protection of Birds for financing and organising their welfare.

### SUMMARY

A pair of Snowy Owls *Nyctea scandiaca* bred successfully on Fetlar, Shetland, in 1967 and provided the first British nesting record in the wild. This followed regular observations of Snowy Owls in Shetland from 1963 onwards after a period of at least 60 years (and possibly nearly 100) in which records had been very scarce. The habitat is described. Of seven eggs laid, one failed to hatch and only five young are known to have fledged successfully. Eggs were laid at a little less than two-day intervals until the clutch was completed on 14th June. Incubation probably began with the first egg and the average interval of hatching was estimated to be about 40 hours between about 4th and 15th July; one egg for which the incubation period is known took 33 days to hatch. The development of the chicks is outlined: the first sustained flight was recorded at 43 days and all five young reared could fly strongly at 50 days.

Other aspects summarised include hunting and feeding; relations with other birds and mammals; reactions to man; voice; and threat postures, distraction displays, displacement activities, behaviour during incubation, nest sanitation, food begging and giving, head swaying and preening. Food consisted mainly of Rabbits *Oryctolagus cuniculus*, Oystercatchers *Haematopus ostralegus* and Arctic Skuas *Stercorarius skua* (both adults and juveniles in each case), but also included a number of other bird species, and mice; there appeared to be no shortage of food, since the male (who did all the hunting until the young were almost ready to fly at about five weeks) was able to spend most of each day resting, and since surplus food was frequently wasted at food depots within 200 yards of the nest.

### REFERENCES

- HARBER, D. D. (1965): 'Report on rare birds in Great Britain in 1964'. *Brit. Birds*, 58: 353-372.  
— (1966): 'Report on rare birds in Great Britain in 1965'. *Brit. Birds*, 59: 280-305.  
HOLLOM, P. A. D. (1962): *The Popular Handbook of British Birds*. London. p.313.  
HAGELL, B., and FRYCKLUND, I. (1965): 'Invasionen av fjälluggla (*Nyctea scandiaca*) i södra Skandinavien vintrarna 1960-1963...' (with English summary). *Vår Fågelv.*, 24: 26-55.  
RUTTLEDGE, R. F. (1966): *Ireland's Birds*. London. pp. 134-135.  
SAXBY, H. L. (1874): *The Birds of Shetland*. Edinburgh. pp. 38-54.  
VENABLES, L. S. V. and U. M. (1955): *Birds and Mammals of Shetland*. Edinburgh and London.  
WATSON, A. (1957): 'The behaviour, breeding and food-ecology of the Snowy Owl *Nyctea scandiaca*'. *Ibis*, 99: 419-462.  
WITHERBY, H. F., et al. (1938-41): *The Handbook of British Birds*. London. vol. 2: 309-312.



PLATE 13. Snowy Owls *Nyctea scandiaca*, Shetland, July 1967. Male barking (page 128); below, female brooding some of the chicks. The smaller male is almost pure white, but the female is barred above and below with brown (except on the face and centre breast); both have golden-yellow eyes (pages 119-132) (photos: Eric Hosking)

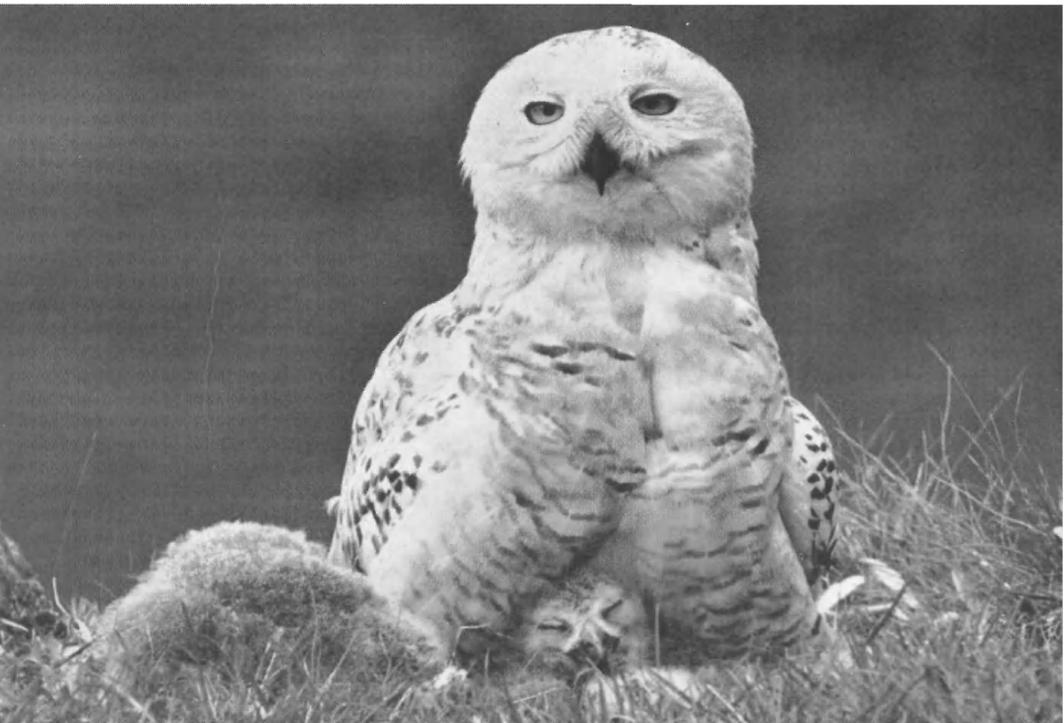




PLATE 14. Snowy Owls *Nyctea scandiaca* and young, Shetland, July 1967. These two photos, with the wings spread, emphasise the male's whiteness and the female's barring; the female became soiled while brooding the young (photos: *Eric Hosking*)





PLATES 15 and 16 (*overleaf*). Three studies of the female at the nest with young. Below, feeding chick with a previously ejected pellet; note also the size of her bill, usually masked by feathers (*photos: Eric Hosking and, above, Dennis Coult's*)









PLATES 17 and 18. Snowy Owls *Nyctea scandiaca*, Shetland, summer 1967. Left top, male mobbed by a Great Skua *Stercorarius skua*; centre, pair threatening intruders (size difference not apparent as male is nearer); bottom, young taking off. Above and below, female and nestling in threat postures (page 129) (photos: R. J. Tulloch)





PLATE 19. Nest of Snowy Owls *Nyctea scandiaca*, Shetland, July 1967. Above, six eggs and one chick in its first white down. Below, six chicks of different ages, having hatched at intervals of about 40 hours; the white down is replaced by dark grey down after 10-12 days (page 121) (photos: R. J. Tulloch and, below, Eric Hosking)

