A VISIT TO KROSSÁRGIL, NORTH-CENTRAL ICELAND, 1954

WITH SPECIAL REFERENCE TO THE PINK-FOOTED GOOSE

By G. K. Yeates

In June 1954, in company with Lt-Col Niall Rankin, I visited North Iceland in order to see and photograph the Pink-footed Goose (*Anser brachyrynchus*). So much has recently been published on this species that further papers on it may appear to require some excuse. Our real reason for concentrating on the Pinkfoot was, of course, that we both wanted to do so, even if the whole world had done so before us ! It was certainly a bird which had never been really adequately photographed at the nest. There were, however, other equally serious considerations. No ornithologist seems to have studied the Pinkfoot for very long in the incubation period ; and the colonies in North-Central Iceland have been rarely visited.

Our route was by jeep from Akureyri to Goðafoss, and down the Barðardalur, along the eastern bank of the Skjálfandafljót, to the farm of Viðikir, where live Kári and Egil Trygvasson, sons of the farmer (Tryggvi Guðmundsson) who took Congreve and Freme on their original discovery of the Pinkfoot in Iceland (Freme, pp. 139–145 ; and Congreve and Freme, 1930). They were also the guides of Finnur Guðmundsson (personal communication), in his expedition to the headwaters of the Skjálfandafljót, and there can be no doubt that no living Icelanders, except perhaps Ólafur Jonsson (1946), better know the remote Ódáðahraun and the distant country to the northern slopes of Vatnajökull. We arrived at Viðikir on 10 June, and from here we rode over to Hrafnabjörg on the 12th ; and on the 13th we were guided on ponies into Krossárgil by Egil Trygvasson. Here we were in camp, until Egil and another brother, Kjártan, came to take us out on 23 June.

The Icelandic goose-story has been a tale so muddled in the telling that only recently has it been clarified by Scott, Fisher and Guðmundsson (1953). The expeditions of the Wildfowl Trust in 1951 and 1953 to the oasis of the Þjórsárver beneath Hofsjökull have shown clearly the pattern of the distribution of the Pinkfoot in Iceland. The Þjórsárver oasis, with over 2000 nests, is the nucleus, the heart and centre, not only of Iceland, but of the Pinkfoot in Iceland. The

breeding-stations to the south, down the Þjórsá, on the Kisa, Dalsá, at Gljúfurleit, and possibly on the Tungnaá (Scott *et al.*, *loc. cit.*) are overflows or outliers. The colonies to the north, based on the three rivers, Skjálfandafljót, Jökulsá á Fjöllum and Jökulsá á Brú, are perhaps best regarded in the same way, though the evidence suggests that, possibly, 50 years ago there existed at Grafarlönd a Pinkfoot colony of some considerable size. If so, the Odáðahraun colonies would be better regarded as relics of Grafarlönd before it was raided out of existence.

Although the large size of the Þjórsárver colony has rightly made its discovery so exciting, the classic ground of the Pinkfoot in Iceland is the Skjálfandafljót gorges and the Ódáðahraun, for it was here that the initial discovery was made —by Congreve and Freme (*loc. cit.*) in Krossárgil in 1929. This was followed by some activity—Magnús Björnsson (1932–34) in 1931, 1932, and 1933, and Haig-Thomas and Bird (1934) in 1933, and Haig-Thomas again in 1936 (1937). Since then only Finnur Guðmundsson in 1945, has visited the more inaccessible colonies, though the Ridley brothers (personal communication) reached Hrafnabjörg in 1952.

Finnur Guðmundsson, reviewing all the evidence and as a result of his own deep penetration of the Skjálfandafljót, has said that there are probably 200 pairs based on the river. Of the position on the two Jökulsás and in the oasis of Herðubreiðarlindir and Hvannalinder we have no evidence since the early thirties (Björnsson (*loc. cit.*) : Roberts (1934)), except that P. Beckett (quoted by Scott *et al. loc. cit.*), found Pinkfeet nesting in the last locality in 1948. Both the Kraká and the Svartá, stated by Björnsson to be nesting localities, should be discounted. Finnur Guðmundsson found there no geese at all. I questioned the Trygvassons closely on this point, and it was clear that there has been confusion with Greylags (*Anser anser*). Kári Trygvasson thought that both species overlapped here and occasionally shared the same islets in the river. All evidence we have goes to show, however, that the two species are more or less mutually exclusive. We never saw a Greylag further south than a mile and half above Hrafnabjörg, where the Pinkfeet took over, although the Greylag is an abundant species on the northern stretch of the Skjálfandafljót. The only exception seems to be an extraordinary case of inter-breeding, discovered by the Ridley brothers near Goðafoss, between a female Greylag and a gander Pinkfoot. The eggs, however, were infertile.

As long ago as 1936 Haig-Thomas (*loc. cit.*) was mystified by the way the geese were leaving Central Iceland. The truth is that all these colonies are merely overflows and outliers and are therefore unstable. Finnur Guðmundsson (1952) has made it clear that, in the last 30 years at least, no blame is to be attached to raids by local farmers. I can confirm this from conversations this year with the Trygvassons. They say that up to the mid-twenties raids were made (on Krossárgil quite apart from the much-raided Grafarlönd), but that none had been made since. They said, in fact, that we were the only people to venture to Krossárgil before mid-July or August, when the geese have of course got their broods off, since Guðmundsson in 1945, and before that, Haig-Thomas in 1936. Any fluctuations at Krossárgil can therefore hardly be laid at the door of human interference.

Yet fluctuations in these colonies are evidently very marked from year to year, and not easily accounted for except on the grounds of instability arising from their outlying character. Thus this year we found six nests (and suspected another two) at Hrafnabjörg, where the Ridley brothers in 1952 could only

find one. On reporting this to the Trygvassons they said that in that case there should be at least 20 pairs at Krossárgil. In the issue, there were four pairs. In short, while Hrafnabjörg was having a record season, Krossárgil, only 17 kilometres away, was at its lowest ebb. No comparable figures exist for Hrafnabjörg ; those that there are for Krossárgil give the following : 20 nests in 1929 ; 30 in 1933 ; 3 in 1936 ; about 15 in 1945 ; and 4 in 1954.

Krossárgil is a barren gorge of naked rock. It is the largest gorge in the Ódáðahraun, cutting some five kilometres into the surrounding hills. It is utterly chaotic—a natural shambles of rock and lava, fantastic and unreal, rather frightening even in the perpetual sunshine of the first week of our stay ; quite terrifying in swirling mist and rain—a godless place. Here, where the very skeleton of earth is exposed, and where there is little or no green growth, old goose nest-mounds were conspicuous—just because they were green (or yellow) as a result of past use by the geese, which had probably in their droppings sown the original seeds and afterwards manured them. Indeed, they stood out like green oases in the dead chaos of the lifeless rock—welcome, even if unoccupied, because in that fearsome gorge it felt good to be anywhere where life had once pulsated. Of these old goose-mounds there were at least 20 on or near the top of the cliffs (and certainly more on the north side of the gorge which we never had cause to investigate in detail). There were many more possible old nest-sites on ledges in the middle of the cliffs. Here it was less easy to be certain, as vegetation seemed able to get here a better natural hold. (Indeed, the cliffs even supported a few flowers, especially *Dryas octopetala*, *Saxifraga stellaris* and *S. cernua*, and the fine *Arabis alpina*.) In addition, there were the islets in the river (which incidentally in June in their grey-green leaf gave promise of a flash of incredible beauty within a few weeks in the form of that lovely willow-herb *Chamaenerion latifolium*). Here the richer vegetation concealed all evidence of erstwhile goose-occupation, but on these islets, *fide* the Trygvassons, five or six pairs of geese have often bred. Thirty pairs in any one season appear to be a maximum for the gorge, although it has many more nest-mounds and possible sites, without taking into account the short gorge of Sandmúladalur close by to the north, which, again *fide* the Trygvassons, holds up to three pairs in some seasons. It seems likely therefore that there is non-breeding in every year. So far as 1954 was concerned, the cause was certainly not bad weather, for Iceland had the mildest winter and earliest spring in the memory of many. All the evidence suggested some form of non-breeding.

Where the Krossá leaves its yawning canyon and joins the Skjálfandafljót, it emerges through a less inhospitable terrain, made grey-green by *Salix glauca*. Here the big river has carved for itself a flat valley, through which it runs in many channels creating islets of grass and pebbles (the ' black sand ' of Central Iceland), and in general a strath of green vegetation. This is the feeding ground of the Krossá geese. On it was always a gaggle of about 25 Pinkfeet. From this gaggle skeins, usually of 5–7, once of 16, regularly visited the gorge, especially in the early morning between 05.00 and 08.00 hours G.M.T. These birds appeared to be merely visiting, as they would fly up the gorge with much goose-talk, circle round the few nesting pairs, cause a general hullabaloo, and return to the strath.

Once I saw a party of 16 pitch on the talus (masses of rock debris) where, if I may be anthropomorphic, they looked extremely foolish, chattering amongst themselves and doing precisely nothing. After 20 minutes of this time-wasting, they proceeded up the gorge. Much more significant than this, I twice saw two

birds (pairs, surely ?) fly up the valley and go to definite, but unoccupied nest-mounds. One pair I watched do this from my tent at 05.00 hours. The gander stood erect on guard: the goose did such a realistic shuffle into the ground that I immediately threw off my pyjamas and waded in my birthday suit across the river to investigate. There was nothing.

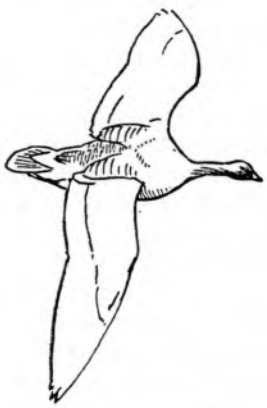
What were these birds—the visiting skeins, the odd pairs that occupied a nest-mound, a territory, as it were ? Carrick and Dunnett (1954) have recently requested greater accuracy in describing birds which are not nesting, and have suggested a series of terms to define such birds. Using their vocabulary, some of these birds would doubtless be 'pre-breeders' i.e., immatures. Some might well be ' prevented breeders,' though certainly in 1954 not because of inclement weather. I think we should have found evidence of ' failed breeders,' for Pinkfoot down and scrapes, though exiguous and small, will provide evidence of occupation for a month or two after desertion. (I found the nest of one definite 1954 ' failed-breeder ' at Hrafnabjörg.) The fact that *pairs* actually visited old nest-mounds and false-brooded (to be quite accurate, sat down there) suggests genuine ' non-breeding,' for surely in the incredibly mild spring of 1954 so large a number of birds as existed in the strath could not *all be* either ' prevented breeders ' or ' pre-breeders.'

True ' non-breeding,' as defined by Carrick and Dunnett (*loc. cit.*), is rare in birds, but it seems that the Pinkfoot may be a sensitive bird in this respect. For instance, the Bird brothers (1946) reported very few Pinkfeet nesting on Hochstetter Foreland in North-East Greenland in 1938, a ' complete non-breeding year ' although ' summer came early: it was very fine; ice conditions were particularly good.' In Krossárgil in 1954 the same held good—and, furthermore, the nest-sites were there, ready and waiting. Apparently so too were the birds. Why did they not respond ? None of the causes suggested by the Birds (*loc. cit.*) or Marshall (1952) seem to give a clue to the answer.

The nest-sites at both Hrafnabjörg and Krossárgil were of the cliff type. Hrafnabjörg is a most desolate lava-gorge, through which the Skjálfandafljót rips its tearing way. The western side is a fearsome and ugly slag-heap of loose scree some 200–250 feet high, in which are several precarious-looking buttresses. The tops of these provided four pairs of geese with nests—and right safe from man or fox they seemed to be. On the eastern (our) bank the cliffs are lower (75–100 feet), greener, and in most parts quite easily negotiable. Here we found two occupied nests, one ' destroyed ' nest of this year, and several nest-mounds, some with nest-scrapes. One nest was in a site that would have admirably suited an eagle—a hollow on a ledge with a protective slab of rock overhead. The other was in the typical Pinkfoot (gorge-nesting) site—on the top of the cliff on a narrow promontory of rock. This is so essentially the normal site in this type of breeding-ground (cf. also Congreve's photographs (1953) of Barnacle Goose (*Branta leucopsis*)) that it is almost certainly chosen in order that, with three sides inaccessible to foxes, the isthmus may be held. Pinkfeet ganders in these gorge-sites, where there is restricted perching or standing space, stay *very* close to the incubating goose, usually indeed cheek by jowl with her.

At Krossárgil, one nest was of this last type ; two were on ledges in the cliff-face ; and the fourth was on top of a mushroom of lava which grew out of a buttress. It formed a large plate some six feet in diameter, and had an ugly fall on all sides of its overhang. A more impregnable nest it would be difficult to imagine.

Pinkfeet apparently differ very much in temperament, as all who have had any dealings with them at the nest agree. Kári Trygvasson tells me that he has actually stroked a goose whose eggs were chipping. The majority are very tight sitters, both goose and gander stretching out low on the ground when human intrusion gets too close—about 150 yards. At Hrafnabjörg the goose did not leave the ' eagle ' nest till my face appeared round a rock four feet away, although her gander had panicked at the sound of our voices above. The bird on the cliff top let us get within 30 feet before flying. At Krossárgil the ' mushroom ' goose, secure in her castle, never flushed, although we passed her daily at 20 yards. The gander here, however, normally left as we drew



level. The two pairs on the cliff face merely crouched, and one gander always amused us by trying to emulate the ostrich by burying his head in the nest-mound ! The pair we photographed unfortunately belonged to the less tame type. The gander had no nerve at all; his goose very little more. Both flushed at 70–100 yards.

Once off the nest, the geese displayed considerable anxiety, circling round, calling in alarm—a curious, high-pitched, di-syllabic *ee-wink ee-wink*. It was much thinner and more squeaky than anything I have ever heard in winter. At this point it may be remarked that it was a strange experience to stand on top of a cliff and look *down* on a pair of geese, circling over the river 150 feet below as though they were Herring Gulls !

The *Handbook* (Witherby *et al.*, 1939) laying dates for this species needs serious revision. ' The middle of June ' may suit Greenland and Spitsbergen : it is a month too late for Iceland. The farmer at Stóratunga, who owns Hrafnabjörg, told us that he found a nest this year on 15 May. At Krossárgil the ' mushroom ' nest had at least two chicks dry and on the move on 21 June. On the 22nd we noted that one of the cliff-nests had hatched and was vacated. Mid-May is evidently the average time of Icelandic laying. Scott, Fisher and Guðmundsson (1953) estimated in 1951 that first eggs were laid in the Þjórsárver on 12 May, most clutches completed by 25 May and that the majority of goslings hatched on 22 June—findings with which our observations closely agreed.

Our 10 days at Krossárgil were concentrated on the geese—all four pairs of them ! Apart from these four pairs and the daily visiting circus of non-breeders, once one penetrated the gorge and the desolate hills, life rather gave up the unequal struggle. The geese apart, this wilderness gave sanctuary only to a pair of Gyr Falcons (*Falco rusticolus*), with a nest amongst the geese (this

was, thanks to rotting carcases, the greenest spot in all Krossárgil) ; one (perhaps two) pairs of Goosanders (*Mergus merganser*) ; at least one pair of Purple Sandpipers (*Calidris maritima*)—these on the desert above ; two pairs of Wheatears (*Oenanthe oenanthe*) ; and above all a string of some 15–20 pairs of Snow Buntings (*Plectrophenax nivalis*). These went on as long as there was water to provide flies for food. Krossárgil is long, and its whole length had never been examined (Guðmundsson). In investigating its upper reaches, Snow Buntings alone convinced us we were not on the moon.

Consequently we got to know the movements of our few pairs of geese with considerable intimacy. I sleep badly in a tent, and those difficult early hours between 02.00 and 06.00 hours were often enlivened for me by *pairs* of geese visiting the strath for their daily bread. Perhaps it was as well we did not strike a year of many breeding pairs, for I cannot resist the call of a goose, and I slept badly enough as it was. But, when one considers the pains Pinkfeet take to make their nest impregnable, it is odd to find that they have evolved a system of feeding which draws *both* birds away from the nest at the same time.

Iceland Falcon

It was, however, not only the nesting geese of Krossárgil and the 25-odd non-breeders in the valley below which occupied our attention. On 16 June, at 20.00 hours, in three winter-skeins, 60 geese flew very high north up the river valley. On 18 June at 07.00 hours a skein of 20 did likewise. Taylor (1953) found this in 1952 in the 'Asterdalur, north-west of Hofsjökull, and suggested a moult-migration of non- or unsuccessful breeders. Clearly it is a feature of late June. Taylor thought it probably greater than usual in 1952 because of the bad spring ; but it is quite clear that not only bad weather influences non-breeding in the Arctic, or this possible moult-migration of geese.

Whether or not this long-distance migration is the moult-answer for non-breeders, it is clear that much moulting takes place in the mountain oases and on the islets in the small upland streams. Here there were many goose-droppings. The winter of 1953–54 had been very mild, with very little snow. In our exploration of the upper Krossá and its tributaries it was clear that the melt of 1954 had been so slight that the stream had never risen in spate high enough to sweep the islets clear of even the leaves of last year's fall of *Salix glauca*. There also remained innumerable goose-droppings, far more than at least the 1954 local population could produce. Is it not hither that breeders and non-breeders come to moult? Perhaps the sorties made daily by skeins up the gorge were preliminary reconnaissances of good and safe moulting-places ? It seems that these remote spots are certainly thus used. If for some, why for

others this Greenland migration? But the day the romantic Pinkfoot fails to set insoluble questions will be a very sad one.

Postscript.—Peter Scott, who has very kindly criticised this paper, writes: "About non-breeding—I think you underestimate the pre-breeding section of the population. I also think mixed-age pairs are common and may account for the strange behaviour of your pairs, i.e. one sex only of breeding age. No geese breed at one year old (so far as we know), and few at two years old. This leaves a fairly large body of 'pre-breeders,' which may be larger if some are paired to adults."

This suggestion goes far to explain the behaviour above described.

Mr Scott has also suggested that the droppings found on the islets in the streams on the plateau may well come from geese on passage migration in spring, when large flocks use the Þórsá–Skjálfandafljót route to Greenland.

REFERENCES

BIRD, E. G. (1934). Notes on the geese of Iceland. *Ibis*, (13) **4**: 170.

BIRD, C. G., and Bird, E. G. (1940). Some remarks on non-breeding in the Arctic. *Ibis* (14) **4**: 671–678.

BJÖRNSSON, MAGNÚS (1932–34). Nokkur orð um grágaesir og helsingja, *Náttúrufraeðingurinn Reykjavík*, 2, 3, 4.

CARRICK, R., and DUNNETT, G. M. (1954). Breeding of the Fulmar. *Ibis*, **96**: 356–370.

CONGREVE, W. M. (1953). Studies of some species rarely photographed. The Barnacle Goose. *British Birds*, 47, pl. 32–4.

CONGREVE, W. M., and FREME, S. W. P. (1930). Seven weeks in eastern and northern Iceland. *Ibis*, (12) **6**: 193–228.

GUÐMUNDSSON, FINNUR (1952). Bird Protection in Iceland. *Bull. Int. Ctee. Bird Prot.*, **6**: 153–60.

HAIG-THOMAS, D. (1939). The mystery of the Pink-footed Goose, in *Pageant of Nature* (ed. Frances Pitt), 208–214.

JONSSON, ÓLAFUR (1946). *Ódaðahraun.* Reykjavík.

MARSHALL, A. J. (1952). Non-breeding among Arctic birds. *Ibis*, **94**: 310–333.

ROBERTS, B. B. (1934). Notes on the birds of Central and South-east Iceland, etc. *Ibis*, (13) **4**: 239–64.

SCOTT, P., FISHER, J., and GUÐMUNDSSON, F. The Severn Wildfowl Trust Expedition to Iceland, 1951. *Severn Wildfowl Trust Fifth Annual Report*, 79–115.

TAYLOR, J. (1953). A possible moult-migration of the Pink-footed Goose. *Ibis*, **95**: 638–642.

WITHERBY, H. F. *et al.* (1939). *The Handbook of British Birds.* vol. III, 197–200. London.