

FURTHER NOTES ON THE BREEDING-HABITS OF THE MANX SHEARWATER.

BY

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THESE notes on the Manx Shearwater (*Puffinus p. puffinus*), taken in 1930, should be added to my first paper on the subject which appeared in *British Birds*, Vol. XXIII., pp. 202-218. Unfortunately my time this year was so occupied that I had no leisure for more than casual observation.

TABLE OF ARRIVAL AND DEPARTURE.

Year.	First bird arrived.	Plentiful by	Last young bird seen alive on land.
1927	—	—	October 14th
1928	February 9th	February 26th	,, 16th
1929	,, 2nd	,, 28th	,, 12th
1930	,, 13th	,, 26th	,, 15th

ARRIVAL FLIGHT.

The majority of adults, as in the past two years, arrived from a south-easterly direction, flying north-westwards through the Broad Sound between Skomer and Skokholm, but many passed on the outer or south side of the latter island, reuniting with the main body westwards of the two islands. Comparatively few birds seem to arrive from the westward, and on several favourable occasions when I was sailing home from Grassholm I observed only single birds at wide intervals flying eastwards thus. The same may perhaps be said of the northward, only scattered birds converging upon Skomer from St. Bride's Bay, as far as I have observed on the few favourable occasions when I have been in that neighbourhood.

I was puzzled to know exactly where the main flock mustered before dark, when, on misty days, they arrived before sunset. From careful watching I am now able to say that they spread themselves in large flocks along a line roughly drawn from a point nearly one mile W.S.W. from Skokholm Head to a point about one mile N.W. of Skomer Head. Here they fly to and fro over the water, the flocks mingling and separating indiscriminately, now flying one way, now wheeling and circling back upon other flocks. Especially in calm weather, they may rest for long periods

on the water, washing, preening, drinking, and diving for food. The arrival of a fresh flock is then often the signal for a general rising, and it is most striking to witness the stretching of hundreds of long black wings simultaneously in flight.

On rough days when the wind lies somewhere between S. and W. it is frequently possible to see the flocks from the cliffs of the W. side of Skokholm, for on those evenings the birds approach to within a few score yards of the shore and carry out their graceful manœuvres and gyrations. They are certainly at their best in such weather.

Having occasion to burn a few acres of old half-dead heather on March 30th, I planned to have it well alight in time to witness the landing of the Shearwaters, and was repaid by what must have been a unique and very beautiful sight. There was a strong south wind blowing which kept the flames very bright and carried the smoke away swiftly and low. The first birds arrived just before 8 p.m., flying in from the north coast, head to wind. Half an hour later there were hundreds in the air, their white breasts flashing as they caught the firelight. The strong wind enabled them to advance very slowly, with wings fluttering or quivering after the manner of a hovering Kestrel. Many in the area of firelight did not pass by at once but, time after time, after slowly advancing with trembling wings, would retreat with the wind again without changing their head-to-wind position or perceptibly altering the motion of their wings; in short, they appeared to be flying "backwards" at one level as easily as they advanced. Other birds would fly fairly close to the flames or the burnt ground and then shoot upwards perpendicularly with great speed until their white breasts barely showed in the sky. They flew at a height above the ground varying from ten feet to as far as eye (say 100 feet up) could see. On calm nights I have observed they proceed, as a rule, by a series of rapid side-to-side glides, but on this night they only glided when falling away to one side, and also they would glide forward shakily with wings much curved just before they dropped to earth.

Many landed at the mouths of their holes, but some on the grass away from holes, and I was rather surprised to see a few of them walking about quite freely, though with frequent pauses, on bent tarsi, with that springy movement which such a walking position gives to the body. When approached they made short little runs upright on their toes, as described in my first paper. It is now clear to me that the adult

Shearwater, when not alarmed and confused, can travel fairly well on land and is able to carry out the business of courtship, home-hunting, nest-building, and not improbably of coition (though I have no evidence of this last) with less awkwardness than is generally imagined. I observed that when encountering irregularities of ground or surmounting the tumble-down hedges they fluttered their wings very slightly in the strong wind and this helped them over easily and without that struggling with feet, wings and beak which generally occurs on calm nights.

CALL-NOTE.

It was most noticeable that very few birds of the vast number flying above the burning heather were calling, yet the cries were as numerous as usual. More noise was made by those birds which had been (and still were as yet) underground all day.

In my first paper the accent on the call-note was omitted by error. I would amend it as below :—

kük-kük-kük-ōō.

When handled, the adults as well as the fledged young scream this same note in their alarm.

COURTSHIP AND NEST-BUILDING.

At present I am not able to give any further details of courtship and this, as well as the meaning of their many nocturnal activities outside and in the burrow, still needs investigating. I have good reasons for conjecturing that there are some quite elaborate and prolonged ceremonies in connexion with nest-making. I found that the usual lining of dead grass, bracken, etc., was already added to the scrape in the recess in every hole I examined on April 3rd, a month before general laying begins. In several burrows running where bluebell and vernal squill flourished, I found the bulbs of these plants lining the nests most decoratively. These bulbs had, of course, been torn from the walls of the burrows, indicating a further nocturnal activity of the nesting adults.

MARKED NESTS OF 1929 IN 1930.

Nest A.—The same pair, 81 and 82, returned to their burrow and were successful in rearing their young one. As usual, they deserted it in the end, but I was unable to keep up a continuous observation.

Nest B.—The same pair, 90 and 83, were present on some days in the latter half of March and this season were successful in rearing a young bird. It was most interesting to find the intruder of last year, 100, also present on some days. In fact, the promiscuity in this burrow before 90 and 83 began to sit was extraordinary. Thus, on March 22nd I found 90 and 83 alone together; on the 26th no birds; on the 27th 100 alone; on the 29th 100 and an unringed bird which I ringed 101; on the 30th 83 and 101 together! This was the night of the heather fire, and when I examined the nest at 10 p.m. I found 83 and 101 still together in the recess, but while I was watching another bird suddenly arrived with a thump upon the turf, four yards from the entrance to the burrow. It was 100!

On the 31st my surmise that 100 had a new mate in 101 was rather upset by finding 101 and a new (unringed) bird in the nest, as also on April 1st and 2nd; none on the 3rd; 100 was alone on the 4th. On May 5th I was further bemused to find 89 and 84 sitting together in the recess (84, it may be recalled, was mate last year of 92 in nest D, which is situate some dozen yards from nest B), while a few inches along the passage was 101! After this, however, 83 and 90 remained in more or less complete possession, and this year had better fortune with their egg.

Nest C.—On March 26th, 99 was with an unringed bird, but on the 29th and 30th was with its mate of last year, 88. This burrow was in disrepair and was trodden in by sheep on the 31st.

Nest D.—This fell in during the winter. 84 (see nest B) alone recorded.

Nest E.—This burrow was lengthened by rabbits and deepened at least another two feet to run under a rock, so that I could seldom reach any birds that may have been present. I could sometimes touch their bills (and get duly rewarded). On March 30th and 31st there was a pair of which I managed to catch one, which proved to have no ring. This was a favourite burrow with rabbits, but I found a nestling Shearwater nearly fledged in this nest on September 4th.

Nest F was unoccupied, the passage being shorter than ever this year.

Nest G fell in during the winter, the trap-door sod giving way as in nests C and D.

It is unwise to draw definite conclusions from such a limited observation, but there is at least every evidence for and none

against stating that the Shearwater pairs for life. Witness the return of 81 and 82 in nest A ; of 90 and 83 in nest B, where also 89 and 100 returned, and of 88 and 99 in nest C.

What does the promiscuity in early spring point to ? Do all these birds in the season of courtship merely use the burrow haphazardly as a hiding-place during the day ?

Another interesting observation was that while the moon was waxing from April 3rd to the 7th hardly any birds remained in the holes by day. In fact, I found no birds at all on the 3rd, 6th and 7th in eleven nests I opened. Correlatively, not more than half, at a very rough estimate, landed at night during that period.

FOOD.

Several people were interested enough to write and ask if I could investigate the food of the Shearwater. The *Practical Handbook* gives "small fish (sprats, etc.) and offal of fish ; also jaws of cephalopods found in stomach". It has often been stated that they eat sorrel and beetles. Sheep's sorrel (*Rumex acetosella*) grows very plentifully around every burrow and I found the dried stems in several nest-linings. It may be that the birds cut down and swallow a certain amount of the short stems of this dwarf plant when they are sitting outside their holes, and perhaps they may pick up the beetles which are found in and about almost every rabbit-hole, although I have not seen them do either.

In my first paper I stated and proved that the nestling was deserted from about the sixtieth day, thereafter receiving no food. Although I have examined the stomachs of one or two fledged youngsters and always found them empty, I wished to have this observation confirmed by more expert opinion. Dr. C. B. Ticehurst kindly consented to examine and report. Of two young birds, caught and killed outside their holes as they stood midnight "vigil" preparatory to their first flight to the sea, on August 16th, and which I sent to him, the stomachs proved empty.

In August and September, when by day the holes are occupied only by downy nestlings, it is not difficult to wait for and catch the parents coming in at night to feed these young. They are quick to enter the burrows and to give the nestlings the entire contents of their stomachs before they settle down to the usual noisy conversation between all three (parents and young). When caught before entering it is a matter of seconds only before they throw up this burden of semi-digested food. Some of the adults which I caught disgorged before I could prevent them, and this, I think,

accounts for Dr. Ticehurst finding the stomachs of three out of five adults which I sent him practically empty.

Dr. Ticehurst reports:—

“Of seven Manx Shearwaters received, two were young birds fully grown with a trace of down still on the nape. Five were adults.

STOMACH CONTENTS.

Both the young birds' stomachs were empty. One adult had a full stomach, one was partly full, the rest were empty or practically so.

The contents consisted of a white, semi-fluid, grumous mass, semi-digested. On examination this proved to consist entirely of fish remains which smelt strongly of herring and there is little doubt that young herring had formed the food supply. There were present a few Nematode worms. I am indebted to Mr. Stevens of the Royal Scottish Museum for confirmation.

Note I.—The stomach of the Manx Shearwater, or rather the proventriculus, is an enormously dilatible sac, which when full fills up the entire body cavity. The gizzard is in comparison a tiny affair, about one inch in diameter, and not markedly muscular. In each case it was practically empty and presumably its only function is to arrest such fish bones as are undissolved.

Note II.—Unlike the Storm-Petrel, in which species it is not uncommon, I failed to find any trace of a right ovary in the Manx Shearwater.

CLAUD B. TICEHURST.”

MOULT.

I am also indebted to Dr. Ticehurst for the following extremely interesting and significant note.

“These adult Shearwaters on August 16th proved to be in a completely fresh moulted state of plumage, every feather having been moulted. As their young had not yet left their nest-burrows, this advanced state of post-nuptial moult is remarkable and could only happen in a species where the incubation- and fledging-periods are prolonged. I can recall no other case where the adults are practically through the moult before the young are fully fledged.”

YOUNG BIRDS' FLIGHT TO SEA.

Where the cliff was more shelving than steep I noticed that some of the young birds suffered severely in their efforts to reach the sea, especially where there was no wind. The weaker birds crashed heavily on the sharp rocks all the way down. Though most of them reached the sea alive, I found several stunned, two killed, and two fallen into crevices out of which they could never expect to scramble.

On September 25th at 3.30 p.m. I saw a young bird come out of a hole and flutter along towards the cliffs, only to fall into another rabbit-hole near the edge. This is the only time I have seen a Shearwater make a deliberate diurnal movement above ground, and in this case it was undoubtedly prompted by that overpowering urge to reach the sea which all these starved deserted fledglings possess.