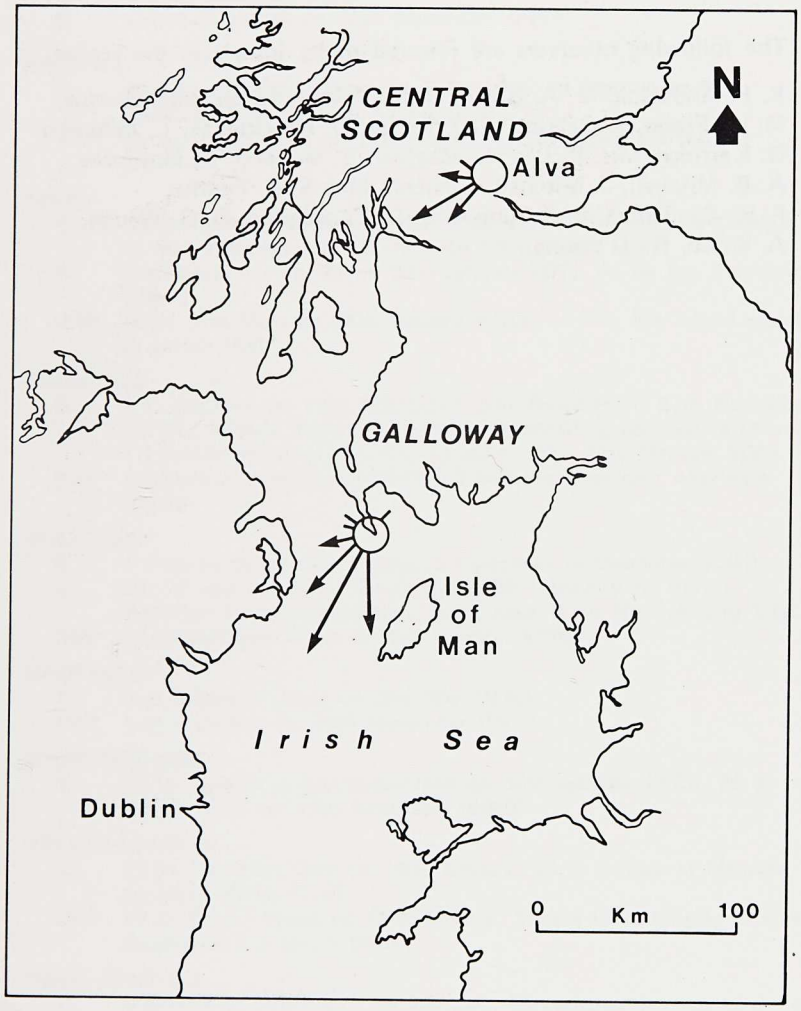

Figure 1 Directions of flight of nocturnal migrants in autumn over central and south-west Scotland. The lengths of the arrows correspond to the numbers in Table 1.

NOCTURNAL MIGRATION IN SOUTHWEST AND CENTRAL SCOTLAND DETECTED BY MOONWATCHING

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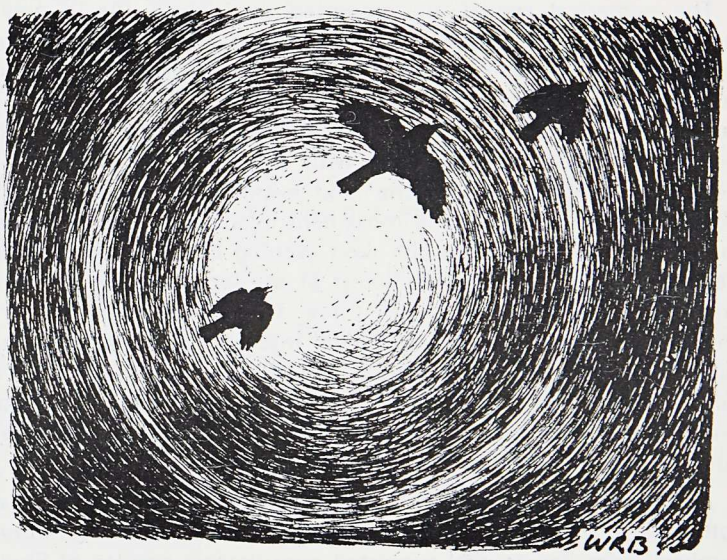

In October 1978 the numbers of night migrants seen crossing the face of the moon were greater than in previous years described in an earlier study (Henty 1978) and I was luckily able to compare results from central Scotland and Galloway. The new data confirm and extend conclusions about the identity and destination of birds flying over central Scotland, the influence of wind direction and the occurrence of calls given in flight.

METHODS

Observations were made with x20 binoculars during clear spells in the evening between 18.25 and 22.25 GMT. On October 12 and 18 I was at Alva, Clackmannanshire, the site of earlier work, just south of

the Ochil hills; on October 13, 15 and 17 I was on the coast 180 km to the south west near the tip of the Mull of Galloway. The techniques of observation and treatment of data are as described previously (Henty *loc. cit.*) and, in addition, attention was paid at the Mull of Galloway to birds seen during the day.

NUMBERS AND SPECIES REPRESENTED

The numerical results are presented in Table 1. As in previous years there is great variation from night to night which is not simply connected with local weather. Thus calm conditions or light winds are in general the circumstances under which large migratory flights are started and the strongest passage (on the 17th, the biggest I have ever seen) occurred in Galloway with a light north wind; however there was negligible passage the next evening with calm conditions inland. Conversely the strong movement inland into a moderate wind on the 12th was followed the next evening by negligible results on the coast during light winds, whilst at the latter site on the 15th a strong passage occurred with force five winds. The important conclusions are that passages of similar intensity can be seen inland in central Scotland and on the coast in Galloway and may occur with quite strong following winds or moderate contrary winds. That many birds may fly into moderate headwinds was also noted in the earlier study.

At the Mull of Galloway many Redwings (*Turdus iliacus*) were both heard at night and seen during the day whilst variation in numbers from day to day suggested considerable passage of Skylarks (*Alauda arvensis*), Song Thrushes (*T. philomenos*), Blackbirds (*T. merula*), Robins (*Erithacus rubecula*), Goldcrests (*R. regulus*) and Wrens (*T. troglodytes*). A few Song Thrushes and Skylarks were heard overhead at night as were single Golden Plover (*Pluvialis apricaria*) and Grey Goose (*Anser sp.*). Extra but imprecise data came on October 15 when there was thin cloud in front of the moon and fifteen birds were seen briefly against this background, most of these were flying between south and west.

DIRECTIONS OF FLIGHT

Inland in Clackmannanshire the direction of movement across the moon was mainly to the WSW, as in previous years. On the coast the direction on the two best nights was much more toward the SSW and S rather than WSW (Figure 1).

Since the winds were northerly this SSW direction of flight is probably due to lateral drift induced by the wind, an effect also suspected at Alva in 1976, although the possibility of birds with a particular preferred direction choosing particular winds cannot be entirely discounted. Lack (1969) concluded from radar studies that, although most variations in track direction were not due to crosswinds, there were occasional passages where the birds were drifted laterally by strong winds, this could occur in both spring and autumn and for day as well as night migrants.

IMPLICATIONS OF THE OBSERVED DIRECTIONS OF FLIGHT

Birds flying WSW over the Mull of Galloway would reach northern Ireland after a sea crossing of only 40 km, and the SW track also involves a relatively short distance of 150 km, to Dublin Bay. However, birds on a track between SSW and S would run a risk of missing both Ireland and Wales unless they showed a dawn reorientation such as Myres (1964) described for the northern North Sea. Such birds could find themselves west of the Scillies at first light. Broadfront movements at night to the SSW over the northern Irish Sea were seen on radar in the late autumn of 1959 by Bourne (1978). Bourne also deduced that with strong northerly winds the birds might find themselves at dawn over the Atlantic to the south west of Ireland but thought that many could have overflown southern Ireland rather than missing land altogether. Bourne saw in addition a movement to the SSE that does not appear in my moonwatch results; this is probably a local effect due simply to the fact that there is practically no land to the NNW of the Mull of Galloway that could act as a source of migrants.

INCIDENCE OF CALLS DURING PASSAGE

Many birds called at night over the Mull of Galloway even on clear moonlit nights whereas, as in previous years, this does not occur at Alva. The most likely explanation is that at Alva they have just crossed 600m hills and are too high to be heard. Alternatively, the presence of the sea may stimulate calling whereas when overland in clear conditions they are silent. I have been unable to find published evidence about whether night migrants can be heard on clear moonlit nights over inland and low lying areas.

NUMBERS OF BIRDS SEEN AT NIGHT AND THE NEXT DAY

At the Mull of Galloway there is in general a very poor correlation between migrants crossing the moon and those grounded next morning. It is not surprising if few migrants land on the Mull with a clear dawn since birds can see land across the North Channel or detect Luce Bay and land before reaching it. It is, however, surprising that maximum numbers of all migrant passerines were seen on the morning of October 14, after negligible moonwatch passage the evening before. The misty conditions at dawn would have greatly increased the chance of night migrants landing on the Mull but I find it difficult to believe that the slight passage indicated by the early moonwatch could have been sufficient. One possibility is that a moderate passage did not reach Galloway until later in the night. However, Bourne (pers. comm.) did not see any southwesterly departure from northeast Scotland on radar and the large number of Redwing calls heard over Galloway in the evening has still to be explained. I had the impression from the calls and the directions of the few birds seen (Table 1) that they were flying in a confused manner at a low height – this last possibility would also explain why only one was seen crossing the moon. Moreover it had been very cloudy since sunset and again after the end of the moonwatch, so that conditions were not good for normal migration, even though it is certain that many Scandinavian migrants had arrived in Scotland and were available to form an onward passage in the light easterly wind. The simplest explanation is that many birds started a nocturnal flight but in a poorly oriented manner at low altitude. It is possible that little net progress was made but in any case conditions would be right for a fall of dawn migrants on an isolated peninsula like the Mull. By comparison, Wilcock (1965) noted similar inconsistency between radar data and counts from the Isle of May and ascribed some discrepancies to birds failing to alight at the observatory and others to birds migrating too low to be detected by radar.

CONCLUSIONS

The results presented here show a SSW direction of migration over the northern Irish sea which is quite consistent with observations by radar. There is support for a previous conclusion that night migrants over central Scotland in mid-autumn primarily originate from Scandinavia and many continue across to Ireland although a substantial proportion at the Mull of Galloway are on tracks that would, if maintained, take them across the full length of the Irish sea

or even out into the western approaches. Further work needs to be done on the incidence of calling during migration flights.

ACKNOWLEDGEMENT

I am very grateful to Mrs. J. Lammie for arranging accommodation for my family at the Mull of Galloway and to W. R. Brackenridge for drawing the illustration.

REFERENCES

BOURNE, W. R. P. 1978. Observations with radar of bird migration across the northern Irish Sea in the late autumn of 1959. *Irish Birds* 1, 199-206.

HENTY, C. J. 1978. A moonwatch study of nocturnal migration over central Scotland. *Scottish Birds* 10, 2-10.

LACK, D. 1969. Drift migration: a correction. *Ibis* 111, 253-255.

MYRES, M. T. 1964. Dawn ascent and reorientation of Scandinavian thrushes (*Turdus* spp.) migrating at night over the north-eastern Atlantic ocean in the autumn. *Ibis* 106, 7-51.

WILCOCK, J. 1965. Detection by radar of autumn migration in eastern Scotland. *Ibis* 316-325.

Place	Date	Wind	Obs. Span. (GMT)	Directions WSW	SW	SSW	S	Other	Total	Time (mins)	Calls
Alva	12	Mod.WSW	18.25–20.22	19	8	2		3W, 1WNW	33	83	0
"	18	Calm	20.34–21.04	—	1	2	—	—	3	30	0
Totals, Central Scotland				19	9	4	0	4	36		0
Mull of Galloway	13	Lt E	21.45–22.35					1WNW	1	50	25*
" " "	15	NW/5	19.50–20.48	3	5	6	2	1W, 1WNW	18	51	55
" " "	17	Lt N	20.38–21.51	2	9	11	10	1NE	33	69	70
Totals, Mull of Galloway				5	14	17	12	4	52		150

These calls came from birds that seemed to be milling about; also three birds were seen close to the moon heading, N, S and E.

Table I Moonface directions and calls of night migrants in Central Scotland (Alva) and Mull of Galloway, October, 1978.