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REPORT ON THE SWALLOW ENQUIRY, 1935.

BY

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THIS, the result of the second year's enquiry into the average size of the broods of the Swallow (*Hirundo r. rustica*) and other questions connected with their nesting-habits (to which is added a census of Swallows and House-Martins nesting in a number of widely separated localities) brings the enquiry to a close at any rate for the present. The results of the enquiry in 1934 were published in *British Birds* XXIX, pp. 3-21, and these two papers should be examined together. An attempt has been made in the summary to draw conclusions from the two. In 1935 we had the advantage of receiving data from the twenty-two localities of 1934, with the exception of six; from two of these the information we got had been only slight; in 1935 reports were sent from three new localities (one in N. Wales and two in Sussex) which to some extent compensate for the loss; the lack of all data from the south-west of England is, however, unfortunate.

The following are the localities from which reports were sent; they are numbered exactly as in the 1934 Report so that comparison can more easily be made.

In those marked C a census was made.

1. Baldernock Parish, Stirling (J. Bartholomew,) 200/300 feet; limestone; rural; dairy farming and agriculture.
2. N.E. of Isle of Man (F. A. Craine), slightly above sea-level; crops by rotation.
3. Cumdivock, Dalston, 7 miles S.W. of Carlisle, Cumberland (R. H. Brown), 300 feet; clay sub-soil; rural; stock-breeding with good grazing. C.
4. An area of one mile from Ullswater (Dr. H. J. Moon), Cumberland-Westmorland boundary; 476 feet; two geological formations—igneous rock and limestone; rural; pastures. C.
6. Near Huddersfield, Yorkshire (W.R.) (J. C. S. Ellis), 300 to 800 feet; lower coal measures; increasingly urban; upland pastures. C.
8. Myddleton and Houghton Green, near Warrington, Lancashire (W. Ritson), 25/50 feet; boulder clay; rural; arable farms.
10. Four miles radius from Alderley Edge, E. Cheshire (E. Cohen), 200/300 feet; red marl and Keuper sandstone; rural and suburban; mainly pastures for cattle.
11. Antrobus and Sevenoaks, N.W. Cheshire (A. W. Boyd), 150 to 284 feet; Keuper marl; rural; arable and grazing land—small farms. C.
- 11A. Near Old Colwyn, Denbighshire (Miss M. Mitchell); sea-level to 400 feet; limestone; rural; sheep and cattle.



12. S.E. corner of Anglesey (R. R. M. Jones), sea-level to 60 feet ;  
limestone ; pastures with a little arable.    C.
13. Parishes of Laugharne, Llansadwren and Llandawke, Carmarthen-  
shire (J. F. Thomas), 10 to 480 feet ; old red sandstone and  
" blown sand " ; rural ; small farms—dairy and cattle raising.  
The average size of 23 farms is 78 acres.    C.
14. Skokholm, Pembroke (R. M. Lockley), 50 to 150 feet ; old red  
sandstone island of 240 acres (3 miles at sea) ; rough grazing,  
heather and bracken.    C.
17. Staunton, S.E. Notts. (Miss F. K. Staunton), 75 feet ; clay soil ;  
rural ; mainly pasture with some arable.
18. N. Norfolk (R. M. Garnett), sea-level to 150 feet ; sandy overlying  
chalky marl ; rural ; marsh, heath-land and arable (barley  
and sugar-beet).    C.
19. Hemsby, near Gt. Yarmouth, E. Norfolk (Miss J. M. Ferrier),  
100 feet ; subsoil clay ; rural ; cereal crops.    C.
20. S.E. Suffolk (A. Mayall), 100/120 feet ; sandy ; rural ; some arable.
21. Seaford, Sussex (J. F. Thomas), sea-level to 700 feet ; chalk ; rural ;  
valleys and downland.    C.
23. Stoughton, 5 miles N.W. of Chichester, Sussex (The Rev. H. J.  
Emmet), 200 feet ; mostly chalk ; rural ; mainly grassland with  
some arable and woodland.
24. Thorney Island, Chichester Harbour, Sussex (P. A. D. Hollom),  
sea-level ; rural ; pasture and arable.    C.

AVERAGE SIZE OF BROODS, 1935.

596 broods in all were examined ; of these (taking all months together) :

					In 1934 (664 broods)
12 or 2	per cent.	contained	one young	each	2.1
35 or 5.87	"	"	two	" "	6.47
94 or 15.77	"	"	three	" "	17.3
221 or 37	"	"	four	" "	39.3
212 or 35.7	"	"	five	" "	31.6
21 or 3.5	"	"	six	" "	3.6
1 or 0.16	"	"	seven	" "	—

2,441 young were ringed or counted giving an average of 4.09 for all broods recorded.

These figures differ only slightly from those recorded in 1934 when the average for the whole year for all broods was 4.01 ; the percentages given above were within 1 per cent. except for the broods of 4 and 5 which were over 2 per cent. smaller, and 4 per cent. larger respectively than in 1934.

Local weather reports have been kindly supplied by the Meteorological Office when they were not supplied by the observers.

In considering the figures given in the following table it will perhaps be wisest to disregard those for Denbighshire (11A) and Sussex (23) ; in each case only 11 broods were counted and it would probably be dangerous to draw any conclusions from so small a number.









## AVERAGE SIZE OF BROODS, 1935.

Locality.	Total Broods Exam- ined	Month	Number Containing							Total Young	Aver- age Year	Total No. of Broods	Aver- age for Year	Nearest Recording Station	WEATHER		Total Inches Rain	Sun hours daily mean
			1	2	3	4	5	6	7						Mean Max.	Temp. Min.		
18. Salthouse, etc., Norfolk.	8	June	—	—	—	5	3	—	—	35	4.37	49	3.93	Cromer (6/9 miles E.)	54.3	42.9	0.78	7.36
	28	July	1	2	3	11	11	—	—	113	4.03	—	—		67.8	51.9	2.45	7.36
	10	Aug.	1	—	1	6	2	—	—	28	3.8	—	—		70.0	56.0	0.96	9.29
	3	Sept.	1	—	2	—	—	—	7	2.33	—	—	70.4		55.8	1.83	7.02	
19. Hemsby, Norfolk.	6	June	—	1	1	2	2	—	—	23	3.83	34	4.11	Yarmouth	53.2	44.9	1.25	8.53
	11	July	—	—	—	2	9	—	—	53	4.81	—	—		64.3	53.1	2.56	7.82
	12	Aug.	—	1	2	9	—	—	44	3.66	—	—	68.8		56.0	1.18	9.96	
	5	Sept.	—	—	1	3	1	—	20	4.0	—	—	69.6		56.0	1.52	7.30	
20. E. Suffolk.	5	June	—	—	3	—	2	—	—	19	3.8	28	4.07	Felixstowe (6 miles S.)	56.6	43.6	1.76	7.91
	13	July	—	1	—	6	6	—	—	56	4.3	—	—		65.4	54.0	2.56	7.66
	7	Aug.	—	—	1	4	2	—	—	29	4.1	—	—		71.3	56.6	0.92	10.10
	3	Sept.	—	—	2	1	—	—	10	3.3	—	—	70.3		56.6	1.69	7.51	
23. Stoughton, Sussex.	4	June	—	—	—	2	2	—	—	18	4.5	—	—	Bognor Regis (11½ miles S.E.)	59.4	45.3	2.79	5.92
	1	July	1	—	—	—	—	—	1	1.0	11	3.81	May		63.7	55.1	2.52	7.22
	6	Aug.	—	—	1	5	—	—	23	3.83	—	—	June		72.2	58.2	0.41	8.77



Once again we see that the first broods are the largest and this is shown in practically every case where a large enough number of broods for fair comparison was examined.

Again we find that broods in the localities furthest to the North have the largest numbers of young, notably those in Stirling and Cumberland ; in fact, the three localities in these counties from which records were sent show a considerably larger average for June, July and August than any others. This bears out the Rev. F. C. R. Jourdain's report that the largest clutches of eggs recorded usually have been found in the northern counties.

It seems reasonable to suggest once more that longer hours of daylight contribute to this result. Actual hours of sunshine do not appear to have the same effect, for though they were specially high in the north in May, the figures for June were very low. The Ullswater area on the border of Cumberland and Westmorland shows quite remarkable figures : of 28 broods in May, June and July, no fewer than 12 were broods of 6 (only 21 broods of 6 were recorded in all localities) ; the average of 5.06 for 15 broods in July is outstanding. Heavier rainfalls coincide with larger broods and certainly cannot be shown to have any effect in reducing them ; the greatest number of inches of rain was recorded from the Lake District where the largest broods were found and it is interesting to note that Anglesey provided a heavier rainfall and a larger brood average than any locality south of the northern counties.

The broods in the southern half of the country are throughout slightly smaller on the average ; it is noteworthy that of the 21 broods of 6 only one was found south of Anglesey and that was in Carmarthenshire ; 11 broods in July in E. Norfolk with an average of 4.8 and 62 broods in Carmarthenshire with an average of 4.06 show higher figures than any other southern localities.

#### FIRST AND LAST EGGS AND BROODS.

First eggs were laid rather earlier than in 1934. The earliest record of all was of an egg laid in April, near Warrington, Lancashire ; the observer reported that it was laid on April 28th-29th and was hatched on May 11th-12th.

First eggs laid in other localities : May 3rd, Seaford, Sussex ; about May 3rd, Alderley, E. Cheshire (5 eggs May 8th) ; May 7th-8th, Antrobus, N.W. Cheshire, and Rowsley, Derbyshire (4 eggs May 11th) ; May 8th, Stoughton, Sussex ; about May 11th, N. Norfolk ; May 14th-15th, Huddersfield (the first



to hatch were at 600 feet) ; May 17th, Anglesey ; May 20th, E. Norfolk ; May 21st, Colwyn Bay, N. Wales ; May 26th, Ullswater and Isle of Man. In 9 localities in which the first egg was recorded in 1934 it was recorded again in 1935—2, 3, 7, 7, 8, 11 and 30 days earlier ; in the other two (both in Norfolk) it was found on the same day and two days later.

Last broods : the last brood at Dalston, Cumberland, flew on August 23rd ; at Huddersfield, hatched on August 21st ; at Colwyn Bay, flew on September 11th ; at Alderley, Cheshire, hatched on September 3rd ; in N.W. Cheshire at least three pairs had third broods and the young were ringed : (1) June 4th, July 24th, September 3rd ; (2) last brood, September 9th ; (3) June 17th, July 29th, September 9th ; in Anglesey the last egg was laid on August 25th and the young flew on September 25th ; in Carmarthen the first egg of the latest nest was laid on August 22nd.

A very late third brood was noted at Cockermouth, Cumberland, which left the nest on October 22nd and did not depart till November 9th (G. W. Muller) ; another third brood at Kirby Muxloe, Leicestershire, flew in October, but two young stayed there till the first week of January, 1936 (Miss O. S. Wilshire).

#### PROPORTION OF NESTS USED MORE THAN ONCE IN A SEASON.

To keep an accurate account has proved difficult to most observers particularly so where a large area has been covered. Stirling—20 broods : 4 nests used twice (7 of last year's nests used—3 of them twice).

Isle of Man—17 broods : 1 nest used twice.

Dalston, Cumberland—41 broods : all nests used twice except two.

Ullswater—Usually a new nest made ; in two cases same nest used, but one of these was not used again by the original pair.

Huddersfield—5 per cent. used twice.

Warrington—35 broods : 7 nests used twice (20 per cent.).

Alderley, E. Cheshire—No definite record of any nest used twice ; 28 were not used twice ; 17 other broods observed, but no record taken.

Antrobus, Cheshire—Use of nests by 25 pairs noted accurately: the same nest was used twice 11 times; and in 14 cases another nest was used. One pair used a different nest for each of 3 broods.

Colwyn, N. Wales—11 broods : no nests used twice.

Anglesey—66 broods : 4.54 per cent. nests used twice.



Laugharne, Carmarthen—4 pairs made new nests for second broods ; no precise information in other cases.

N. Norfolk—45 nests used once, 5 used twice, but records could not be made complete.

Hemsby, E. Norfolk—17 pairs examined ; all double brooded ; of these 17 pairs 8 built new nests for first brood and 9 used old nests ; all built new nests for second broods.

Stoughton, Sussex—11 broods : two nests used twice.

In the great majority of cases it is obvious that a second nest is used though these are often old nests used in earlier years. As in 1934 the Swallows at Dalston, Cumberland, showed greater consistency in using the same nest a second time than in any other locality from which records were sent.

#### SIZE OF CLUTCH AND SUBSEQUENT SIZE OF BROOD.

Few observers found it possible to keep adequate records on this point. The following are the results obtained :

Dalston, Cumberland. One clutch of 6 produced 4 young ; in other nests all eggs hatched.

			<i>Nests.</i>	<i>Clutch.</i>	<i>Brood.</i>
Huddersfield	...	...	15	4.4	4.33
Alderley, Cheshire...	...	...	43	4.18	3.83
Antrobus, Cheshire	...	...	19	4.6	4.1
Laugharne, Carmarthenshire	...	...	17	4.47	4.12
Anglesey	...	...	6	4.6	4.3
Staunton	...	...	7	5.0	4.0
Stoughton, Sussex	...	...	10	4.5	3.5

One clutch of 7 eggs produced 7 young (Alderley, Cheshire); another clutch of 7 eggs (High Legh, Cheshire) produced only 4 young.

An average of the records from the last seven of the localities quoted show that in 117 nests from all districts the average clutch was about 4.4 and the average brood 4 ; roughly about 10 per cent. of the eggs failed.

#### RELATION TO DOMESTIC ANIMALS.

The following figures have been given in answer to a series of questions in an attempt to trace the extent of the association between Swallows and domestic animals.

Stirling :

In byre 7 ; in styre 4 ; in fowl shed 3 ; unused sheds 3 ; boilerhouse 2 ; dwelling house 1.

Isle of Man :

In unoccupied buildings 15 ; 1 associated with animals and 1 with fowls.

Dalston, Cumberland :

All nesting pairs associated with animals or fowls.

Ullswater :

With animals 18 (cattle 13, pigs 4, horse 1) ; with fowls 3 ; dwelling houses 4 ; unoccupied buildings 19.



Huddersfield :

With animals 9 ; fowls 1 ; unoccupied buildings 4.

Near Warrington, Lancashire :

With animals 7 ; fowls 3 ; unoccupied buildings 25.

Near Alderley, Cheshire :

With domestic animals 32 ; fowls 2 ; dwelling houses 4 ; not associated with animals or man 1.

N.W. Cheshire :

With domestic animals 66 pairs ; directly associated with fowls 19 pairs ; dwelling houses 8 ; unoccupied buildings 3.

Colwyn Bay :

With cattle 7 ; with pigs 3 ; indirectly associated with farm animals 1.

Anglesey :

With animals 24 (cattle 16, pigs 4, horses 2, dogs 2) ; with fowls 5 ; dwelling houses 4. In unoccupied buildings unassociated with animals or man 58.

Carmarthenshire :

With animals and fowls 101 ; dwelling houses 7 ; unoccupied buildings 3.

Staunton, Notts. :

Of 9 pairs 7 were in coalsheds, etc., in use by man ; only 2 associated with animals.

N. Norfolk :

With animals 28 ; dwelling houses 6 ; unoccupied buildings 22.

E. Norfolk :

With animals 3 ; with fowls 3 ; dwelling houses 5 ; unoccupied buildings 6.

S.E. Suffolk :

With animals 6 ; with fowls 2 ; dwelling houses 6 ; unoccupied buildings 14.

Seaford, Sussex :

With animals 14 ; dwelling houses 2 ; unoccupied buildings 1.

Stoughton, Sussex :

Dwelling houses 2 ; unoccupied buildings (disused stables, etc.) 9 ; there was no association with animals.

Thorney Island, Sussex :

With animals 10 ; unoccupied buildings 6.

In framing the questions to which these figures are the replies it was specially asked that figures should be given for nests "in unoccupied buildings, etc., where there is no association with animals or man."

Once more we are brought to the conclusion that it is the nesting-site rather than animals present that is the decisive factor. Association with animals is obvious and (with an increase in the number of fowls kept) a growing association with fowls, but we cannot overlook their frequent nesting in unoccupied buildings as in the Isle of Man, Ullswater, Warrington, particularly in Anglesey, and in Norfolk and Suffolk.



It is perhaps noteworthy that on Skokholm Island Swallows did not nest till sheep were kept on the island ; in September, 1934, the sheep (about 200) were removed and though Swallows returned in 1935 they did not stay to breed. Evidence of one pair only, it is true, but possibly evidence of some value.

#### USURPATION OF SWALLOWS' NESTS BY OTHER BIRDS.

House-Sparrows and Wrens occupy Swallows' nests far more frequently than other birds, but usually the nests they use are old Swallows' nests, so that there are few cases of eviction as often happens with House-Martins.

House-Sparrows built in two old nests at Dalston, Cumberland, in three in N.W. Cheshire (in two of which the House-Sparrows built an undomed nest, for, as the Swallows' nests were close to the roof, they let the roof of the sheds take the place of their usual domes) ; in Anglesey they built in five nests and in Carmarthenshire in seven old nests ; in one nest at Staunton, Notts. In Anglesey a nest with three well-incubated eggs was actually pulled down and destroyed. At Ullswater House-Sparrows roosted in two Swallows' nests and evicted the owners ; at Tabley, Cheshire (D. J. Hemming), they drove Swallows away from a completed nest and in N. Norfolk House-Sparrows drove away a pair that had successfully reared one brood and built a new nest. Wrens used a half-built Swallows' nest as a foundation for their own at Ullswater ; they built but did not lay in an old nest at Tabley, Cheshire (D. J. Hemming) ; at Colwyn Bay they occasionally use old nests ; in Anglesey they built in 4 nests, in Carmarthenshire in 3 old nests and in Notts. in one nest.

A Robin's use of an old Swallows' nest at Tabley, Cheshire, as reported by Mr. D. J. Hemming is worth giving in full. The Redbreast built in one of two old nests (the other was occupied by a Wren) and had hatched four young when the Swallows came; the Swallows drove the Redbreasts away and each of the dead young was found to have a wound over the eye like a peck, but it was not possible to say that this was done by the Swallows. All the nests were then removed and the Redbreasts built a new nest on a board that had been fixed under the Swallows' nest and reared four young again for eight or nine days ; once again the Swallows caused them to desert.

A pair of Swallows built a nest on the top of an old Song-Thrush's nest in a shed in N.W. Cheshire.

It was reported from Ullswater that Starlings disturbed Swallows and caused two pairs to desert.



## INTERFERENCE BY DESTRUCTIVE ANIMALS AND BIRDS.

Few reports received.

House-mice destroyed eggs in two nests at Ullswater ; Dr. Moon states that rats rarely seem to trouble Swallows there, but that he has suspected weasels (but not stoats). At Warrington a brood four to five days old was almost certainly taken by rats and in N. Norfolk rats or mice are believed to have taken the eggs from one nest.

At Ullswater a Tawny Owl took a sitting bird in a byre.

From Carmarthenshire the only interference was from a man who objected to a nest in a garage ! The superstition that cows will give bloody milk if the Swallows' eggs are taken is found to be held at Weaverham in mid-Cheshire as well as in Derbyshire, and in Swainson's *Provincial Names of British Birds* this belief is recorded from the N. Riding of Yorkshire. This and the belief that they bring luck protect them from much human interference.

## RELATION TO HOUSE-MARTINS.

Once more we find little or no trace of competition between Swallows and House-Martins and in many localities from which reports have been sent Martins are scarce or absent.

Thus in Stirling only one Martin's nest was known in the area covered ; in the Isle of Man the two species nested together in only one farm (five pairs Martins and one pair Swallows) ; at Dalston, Cumberland, none nested together (only four pairs Martins to twenty pairs Swallows) ; at Ullswater none nested together, but in four cases Martins built outside the same buildings ; near Huddersfield, Yorks, there were none and near Warrington, Lancs., no nests were found. In N.W. Cheshire in the census area Swallows nested in 49 farms, in 5 of which Martins also nested, and Martins also nested in 4 farms from which Swallows were absent ; the sites seemed to have little in common except that five out of eighteen Martins' nests were in cart-sheds where Swallows might have nested—the other Martins' nests were in haysheds or under eaves.

In Colwyn Bay the two species nest together in one farm with Martins in the majority. In Anglesey there were two pairs of Martins in the area under observation, but no Swallows within a quarter of a mile of either. In Carmarthenshire the two species nested together in seven places and Martins alone in four others. At Staunton, Notts., no Martins were seen. In N. Norfolk in three villages there were 151 pairs of Martins to 56 pairs of Swallows in the area covered, the former being concentrated in the villages whereas the Swallows



were much more widely distributed ; and though in E. Norfolk there were thirty pairs of Martins to seventy-four of Swallows in the census area in no cases did they nest together. At Seaford, Sussex, the two species nested together in three farms and on Thorney Island, Sussex, they nested in the same buildings or groups of buildings in three out of nine groups occupied by one or other species.

#### MOVEMENTS OF YOUNG.

Mr. J. Bartholomew reports the discovery about September 2nd in a farm-lott in Stirlingshire of two dead young Swallows, members of two broods which had been marked in a farm half a mile away on June 29th. This visiting and entering of buildings other than those where they were reared has been noticed in Antrobus, N.W. Cheshire, on several occasions during the autumn migration ; on one occasion a young ringed Swallow was found dead in a Swallow's nest in a shed in a farm a quarter of a mile from where it was marked, and annually a few unringed young Swallows are caught in a shippon where two or three pairs breed, all of whose broods have been carefully ringed.

Young ringed House-Martins have also been caught in Cheshire in a nest on another farm, and in August Martins have been seen entering an unused old nest in a farm where none had bred ; it would seem that it is natural to a Martin to enter a Martin's nest even if it is in no way connected with that nest.

For the following report we are indebted to Mr. H. Britten of the Manchester Museum.

#### PARASITES OF SWALLOWS AND ANIMALS FOUND IN THEIR NESTS.

The inhabitants of over twenty Swallows' nests, examined from various localities by myself and Mr. Gordon B. Thompson of the British Museum, have again proved exceedingly interesting, and especially so were several sent to me from Le Vesinet (S. et O.), France, by G. R. Mountfort ; these will be quoted in full at the end of this report. Nests were received from the following localities :—

1. Aghalee, Co. Antrim, J. Kerr ;
2. Baldernock Parish, Stirlingshire, J. Bartholomew ;
3. Aberlady, East Lothian, G. Charteris ;
4. Edgerton, Huddersfield, J. C. S. Ellis ;
5. Several Cheshire localities, E. Cohen and A. W. Boyd ;
6. Llandulas, Denbighshire, Miss M. Mitchell ;
7. Penmon, Anglesey, R. M. Jones ;
8. Laugharne, Carmarthen, J. F. Thomas ;
9. Dumbleton, Glos., G. Charteris ;
10. Newbury, Berks., C. Brown ;
11. Weybourne, N. Norfolk, R. M. Garnett ;
12. Kelvedon, Essex, D. J. W. Campbell ;
13. Chichester, Sussex, Rev. H. J. Emmet.



## PARASITES FOUND IN SWALLOWS' NESTS.

(i) *Siphonaptera*.

*Ceratophyllus gallinæ* Schrank. This common bird flea was again present in a number of the nests both as adults and larvæ.

*Ceratophyllus garei* Roths. A single female of this common bird flea was present in one nest from Northern Ireland.

(ii) *Diptera*.

*Phormia sordida* Zett. = *Protocalliphora caerulea* R.-D. Many pupæ of this fly were present, and larvæ were taken from young nestlings when being handled to attach rings. A new factor with regard to this fly came to light this year; this was the presence of a small Chalcid parasite which accounted for 95 per cent. of the pupæ of this fly, and indeed some nests with numerous fly pupæ did not produce a single imago but scores of this brilliant little green Chalcid.

(iii) *Chalcidæ*.

*Mormoniella vitripennis* Walk. This parasite apparently attacks the pupæ of a number of the larger flies, and it was interesting to find it was present from Scotland to the south of England, and at the peak of its parasitism at the same time in these widely separated districts, so that in all probability the blue bottle will be greatly reduced in numbers next season.

(iv) *Acari*.

*Dermanyssus gallinæ* Redi. The red mite was again in countless numbers in many nests, one nest with dead young was simply a heaving mass; there were no pupæ of the blue bottle present to account for the death of the young birds, so that presumably the mites were the culprits in this instance. They were present in every nest examined.

## OTHER ANIMALS (NOT PARASITES) FOUND IN SWALLOWS' NESTS.

(i) *Psocidæ*.

*Troctes divinatorius* Mull. was the only booklouse met with this season, and only from one nest where the red mites were in large numbers.

(ii) *Orthoptera*.

*Forficula auricularia* L. The common earwig was again present in several of the nests examined.

(iii) *Hemiptera*.

*Lyctocoris campestris* F. Again present in several nests, especially those containing an abundance of the red mite.

(iv) *Lepidoptera*.

*Borkhausenia pseudopretella* Staint.

*Endrosis lactella* Schiff.

*Tinea pellionella* L. ?

*Tineola biselliella* Hüm. The larvæ of these moths were feeding on the lining of most nests, often two species in one nest.

(v) *Coleoptera*.

*Cartodere ruficollis* Marsh. This tiny inhabitant of barns and haylofts was again present in some of the nests.

*Attagenus pellio* L. The larvæ of this Dermestid beetle were present in one nest. These larvæ are usually present in all attics and outhouses, living on the dead bodies of insects and other small animals.

(vi) *Diptera*.

Many flies were sent in by one correspondent as occurring in the vicinity of the Swallows' nests. They were in no way connected with the nests and they are therefore omitted from this report.



(vii) *Arachnidæ*.

*Oonops pulcher* Templ. This tiny spider was present in one nest; it is generally found amongst debris of various kinds, both in buildings and outside.

*Amaurobius similis* Bl. This large and distinctly marked spider was present in one nest and is usually found in crevices in walls or beneath loose material everywhere.

(viii) *Pseudoscorpiones*.

*Cheridium museorum* Leach. Again present in several of the nests examined.

(ix) *Acari*.

*Glyciphagus domesticus* De G. This generally distributed mite of the house and store was again present in one or two of the nests.

The following are some interesting details of the insects sent from young Swallows and nests in France :—

(i) *Siphonaptera*.

*Siphonaptera hirundinis* Cart. A single example of this common House-Martin flea was taken from a young nestling Swallow; it will be interesting to learn whether this flea is often found on Swallows on the Continent, or if this was an accidental occurrence like the cat, dog or rat fleas on human beings.

(ii) *Diptera*.

*Stenopteryx hirundinis* L. This was stated to be the commonest parasite of Swallows and House-Martins in France, every nestling having at least two, or even four amongst its feathers; this was so unlike our experience in the British Isles that I specially asked whether this was not an error with respect to the Swallow, but was assured that it was quite correct.\*

*Ornithomyia biloba* Duf. This fully winged fly, very much like one found on many of our British birds, was taken on nestling Swallows, and with one exception, always in sheds where cows were present; the farmer stated that the flies were also on the cows, but my correspondent has been unable to verify this up to the present. The other nest where these flies were present was in a fowl shed.

When at the British Museum recently Mr. Gordon B. Thompson showed me one example of this fly from young Swallows in Belgium, so that it is quite possible that it is associated with the nests of this bird on the Continent, and an examination of the nests used last season would probably result in the discovery of the puparia in the nests.

HARRY BRITTEN.

## CENSUS.

A census was made in eleven areas, as against twelve in 1934; seven were exactly the same areas as those covered in 1934 and in the others—two in Cumberland, Carmarthenshire and Thorney Island, Sussex—a census was made for the first time. The numbers before each locality correspond with the fuller descriptions earlier in the text.

\*Seen on nestling swallows near the Somme, France, 1917 (A.W.B.).



*Census Results. Swallow, 1935.*

Locality.	Area in acres.	Altitude	Type.	Breeding Pairs.		Swallow density per 1,000 acres in 1934.
				Number	Density per 1,000 acres.	
3. Cumdivock, Dalston, Cumberland.	935	300 ft.	Rural. Stock-raising.	20	21	—
4. 4 miles radius of Ullswater, Cumberland.	32,000 (approx.)	476 ft.	Rural. Pasture land.	109 (approx.)	3.4	—
6. Huddersfield, Yorkshire.	2,400	300—800 ft.	Urban and upland pastures.	14	6.6	5
11. Antrobus and Sevenoaks, N.W. Cheshire.	2,717	150—284 ft.	Rural. Dairy and mixed farms.	84/5	31	33
12. S.E. Anglesey.	1,515	0—60 ft.	Rural. Pasture.	66	43	40
13. Laugharne, etc., Carmarthenshire.	3,435	0—480 ft.	Rural. Dairy farming.	81	23.5	—
14. Skokholm Island, Pembrokeshire.	240	0—150 ft.	Rough grazing and heather.	Nil.	Nil.	4
18. Salthouse, N. Norfolk.	4,160	0—260 ft.	Sea-coast villages Arable and heatherland.	56	13.5	13
19. Hemsby, E. Norfolk.	1,739	0—100 ft.	Rural. Cereal crops.	74	42	35
21. Seaford, Sussex.	7,680	0—750 ft.	Coastal downland and river valleys.	15	2	3
24. Thorney Island, Chichester Harbour, Sussex.	1,200	Sea-level.	Rural. Pasture and Arable.	16	13	—

Total Acreage.    Total pairs of Swallows.    Average Density per 1,000 acres.

11 Sample Areas    ...    58,021

536

9

*Census Results. House-Martins, 1935.*

Locality	Area in acres.	Breeding Pairs.		Density per 1,000 acres, 1934.
		Number.	Density per 1,000 acres	
3. Cumdivock, Dalston, Cumberland	935	4	4	—
4. 4 miles radius of Ullswater, Cumberland	32,000 approx.	90 approx.	3	—
6. Huddersfield	2,400	Nil.	Nil.	Nil.
11. Antrobus and Sevenoaks, N.W. Cheshire	2,717	18	6	10
12. S.E. Anglesey	1,515	2	1	1
13. Laugharne, etc., Carmarthenshire	3,435	30—40	8—11	—
14. Skokholm Island, Pembrokeshire	240	Nil.	Nil.	Nil.
18. Salthouse, N. Norfolk	4,160	151	36	38
19. Hemsby, E. Norfolk	1,739	30	18	—
21. Seaford, Sussex	7,680	23	3	3
24. Thorney Island, Sussex	1,200	28	23	—

Total acreage.

Total Pairs of House-Martins.

Average density per 1,000 acres.

11 Sample Areas    ...    58,021

376—386

6½



## CENSUS.

(i) *The Swallow.*

In those areas where the census made in 1934 was repeated in 1935 the results showed only the most trifling variation, and were in fact hardly more than might be accounted for by the observers' missing one or two pairs in either year; the figures for S.E. Anglesey for example which were 62 in 1934, should probably have been 64, for the figures for 1935 (66) include two pairs in a farm which could not be visited in the earlier year.

Two of the new census areas, in Cumberland and Carmarthenshire, both rural cattle-raising districts at low altitudes show almost the same density—21 and  $23\frac{1}{2}$  pairs to the 1000 acres; and an interesting addition to our knowledge has been gained by an attempt at a census in part of the Lake District of Cumberland of the Swallows in a very large area which comprised much mountain and moorland, and where the density is shown to be about  $3\frac{1}{2}$  pairs to 1000 acres—much the same as that of the Sussex downland, the Suffolk heathland and the hilly industrial district of the Lancashire-Cheshire border in the 1934 census.

The density on Thorney Island, Sussex, is the same as that of a coastal area in N. Norfolk—13 to the 1000 acres. The one area which shows a material increase in number is Hemsby in E. Norfolk—from 35 to 42 pairs to the 1000 acres, figures which in each year show that this area in particular, though not in a cattle district, is peculiarly favourable to the species.

(ii) *House-Martin.*

Figures for this species are too meagre to allow such comparison between the two census years, but again the variation is surprisingly small; the figures for N. Norfolk, the locality showing the greatest density, are almost identical—36 to the 1000 acres as against 38 in 1934.

Variation in density between different localities does not seem to follow that of the Swallow.

The big Lake District area and the Sussex downland show the same small figure of 3 pairs to 1,000 acres, but although in Carmarthenshire there were 8 to 11 pairs to that area, yet in S.E. Anglesey there was only 1 and that in the district where the Swallow shows the greatest density in our records. The Martin is absent altogether from some districts which Swallows inhabit regularly. The lack of suitable mud for nest-building may well be the cause of the Martin's absence from some districts and of their scarcity in others.



## SUMMARY OF THE 1934 AND 1935 ENQUIRIES.

1. *Average size of broods.*

The first brood is the largest.

So far as the records of two years can do so, they show fairly conclusively that Swallows in the Lowlands of Scotland and north England lay larger clutches and rear larger broods (in June and July in particular) than birds breeding in the southern half of England. This suggests an association between longer hours of daylight and larger broods. Heavier rainfall cannot be shown to have any adverse affect. The average brood for the whole country is just over four for the whole season.

2. *First and last eggs and broods.*

Swallows do not lay till some weeks after their first arrival. In two years the earliest egg was laid on April 28/29; the earliest eggs are usually laid in the first or second weeks of May and sometimes not till the last week of May and early June.

A few pairs rear three broods in the season and the young of the last brood may occasionally be found in the nest till late in October.

3. *Use of nests more than once in a season.*

The use of a nest more than once in the same season follows no rule other than arbitrary choice; some recorders have found none that were used twice and in other localities the number varied from 3 or 4% to 40%.

The use of nests built in previous years is general and often one of these is used for a second brood.

4. *Size of clutch and subsequent size of brood.*

The normal clutch is five; six eggs are not infrequent, but found usually in the northern counties; seven eggs recorded three times; sets of eight and nine eggs were probably laid by two hens. Infertile eggs or mortality among young reduced the size of the brood in all districts; often the loss from these causes was trifling, but in the southern half of the country it amounted to as much as an average of one young bird per brood.

Accurate data from 118 nests in 1934 and 117 nests in 1935 from various districts, show that 10% of the eggs laid fail to produce young—or at least young that survive.

5. *Relation to domestic animals.*

Though there is an obvious association of Swallows with cattle, horses, pigs and to a lesser though growing extent with



fowls, it is impossible to show that the presence of animals is a ruling factor in attracting them ; a suitable nesting site even in an unoccupied building is apparently almost as potent an attraction as one where animals are present.

#### 6. *Usurpation of nests by other birds.*

House-Sparrows and Wrens often occupy Swallows' nests. House-Sparrows occasionally are known to drive Swallows away or destroy a nest, though usually they build on a Swallow's old nest. Wrens occupy old nests. Robins and a Spotted Flycatcher have built in Swallows' nests.

#### 7. *Interference by destructive animals or birds.*

Swallows' nests are usually free from interference. Rats and mice are responsible for most damage.

Superstition is effective in protecting them from human interference and from this they suffer less than most birds.

#### 8. *Relation to House-Martins.*

Though they feed in company there is little or no competition for nesting sites, and consequently the two species do not clash.

#### 9. *Parasites.*

The most important parasites that prey on Swallows are a blue-bottle fly and a red mite ; the larvæ of the former probably cause many deaths among young Swallows, and red mites, which swarm in countless numbers, are presumed to have killed others. This blue-bottle (*Phormia sordida* Zett.—*Protocalliphora caerulea* R.D.) is evidently widespread and the red mite (*D. gallinae* Redi.) was found in every nest examined. Another insect of considerable importance in the economy of the Swallow is a small Chalcid, itself parasitic on the blue-bottle fly mentioned above.

Many other insects occupy Swallows' nests, but are of lesser importance to their hosts : a bug that feeds on the pupæ of fleas, of which two species occur ; moths whose larvæ feed on the feathers in the nests ; beetles ; false-scorpions, etc.

#### 10. *Census.*

##### (i) *Swallow.*

Swallows favour a rural area where there are suitable buildings for their nests. Their density varies from over 40 pairs to the 1,000 acres in districts of Norfolk and Anglesey where nesting-sites are easily available, and between 20 and 33 pairs



in the cattle-raising districts of western England and Wales, to comparatively low numbers (2 or 3 to 6 pairs to the 1,000 acres) in a large area in the Lake District, in the industrial and urban north, in Suffolk heathland and Sussex downland.

(ii) *House-Martins*.

The variation in density between different localities is quite different from that of the Swallow. They are prone to concentrate in groups and whereas Swallows are far more generally distributed Martins are the more urban and suburban species of the two. From many apparently suitable areas they are almost entirely absent; in others they are abundant and far outnumber the more scattered Swallows.\*

\*A paper on the results obtained from ringing Swallows will be published later.





1937. "Report on the swallow enquiry, 1935." *British birds* v.30 June 1936-May1937, 98-116.

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