The Heron (Ardea cinerea) in Somerset

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Supplement to Part I[1]

DATA ON BREEDING IN THE COUNTY FOR 1930

The writer was unable to visit Somerset in the spring of 1930, but observations were made by correspondents at practically all the sites and counts of nests are available for most of them. Somerset was one of the three counties in which the maintenance of an annual census over a period of years was specially recommended in the *British Birds* Heron Census Report, and it is hoped in future to arrange for the taking of regular annual counts at all sites. The 1930 data are as follows :

Somerton. Mr. R. Pretor-Pinney was unable to get an exact count, the foliage being particularly dense, but considers that there were rather fewer occupied nests than in 1929.

Halswell Park. 33 occupied nests, 28 at the usual site and 5 more, in which broods were reared, about 1,000 yds. to the west. Several trees in which nests were built in 1928 and 1929 were blown down during the severe gale in February, just when the birds were coming back, and this possibly caused some disturbance, though the fallen timber was not removed or cut (*Keeper William Thomas*).

Banwell. Total of occupied nests, May 24, probably not less than 28, with possible maximum of 32. Nests with visible young or remains of egg-shells below, 21 ; nests (other than the preceding) with large amount of droppings below, so presumably new, 2 ;

[1] Part I appeared in the *Proceedings*, lxxv, pp. 61–90.

nests with *some* droppings below and probably occupied, but a little more doubtful, 9. A number of young had undoubtedly already flown (*W. R. Taylor* and *F. R. Willcox*).

BROCKLEY. 17 occupied nests visible, June 1, all in ashes, but the oaks (which contained several nests in 1928) were in full foliage and no nests could be seen in them (*F. R. Willcox*).

FIVEHEAD. Number of nests in mid-March approximately as in 1928 and 1929, but heronry not visited after that date (*Rev. C. J. Pring*).

ALLER'S WOOD, DULVERTON. Not more than 9 pairs bred (*Dr. H. Campbell Thomson*).

SHAPWICK. 16 nests occupied (*S. Lewis*).

MARSTON PARK. 6 occupied nests (*J. Snelgrove*).

ETSOME WOOD. 10 occupied nests, May 30 (*R. Pretor-Pinney*). An interesting and gratifying increase in this newly-established colony.

EDINGTON. Deserted (*S. Lewis*).

NEAR WILLITON. Three birds visited the site in the spring, but none bred.

EXFORD. Herons did not breed in Court Copse ; one bird believed to have been shot (*Rev. A. C. Carne*).

In addition to the above, particulars have been received of a curious case of an isolated nest at a new site and of a small colony on Exmoor, which, somewhat astonishingly, has escaped notice up to the present year. Details of these follow :

WITHYPOOL

I am indebted to Mr. David B. Grubb for kindly informing me of the existence of a hitherto unrecorded small heronry in a wood on the Barle near Withypool. On May 29, 1930, he found two nests in oaks about 50 yds. apart and each containing two fully fledged young. A third nest a little higher up the slope was obviously new, but was empty and had certainly not had young reared in it. Only four old birds were in evidence. Later Mr. Grubb was able to ascertain that Herons had nested in this locality for about ten years, usually two or three pairs. Unfortunately four birds are stated to have been killed not very long before Mr. Grubb's visit, which would account for the empty nest. That this well-established little colony, known to at least some of the local people for a decade, should have escaped notice for so long and not even have been brought to

light by the special enquiries made in connexion with the 1928 Heron Census illustrates forcibly how difficult it is to make certain that no regular breeding places have been missed even in a comparatively well-worked county.

East Huntspill

Mr. F. H. L. Whish reports an extraordinary case of a Heron's nest built in 1930 about 12 ft. up in a small apple-tree in an orchard in the parish of East Huntspill. It was a very badly made nest lined with fibre of sorts, and when seen by him contained three young, of which one was about half the size of the other two. This case was also investigated by Mr. Lewis.

CORRIGENDA IN PART I

p. 72, line 22, *for* ' May 8 ' *read* ' June 8 '.
p. 79, Ice House Copse, Shapwick, under ' NUMBERS ' *add :* ' 1928, 14 pairs (*S. Lewis*) '.

Part II

SOME ECOLOGICAL DATA AND GENERAL CONCLUSIONS

The present section is mainly devoted to a variety of matters bearing on the ecology of the Heron in Somerset which it has seemed best to treat independently of the accounts of the actual heronries. Some of them are quite evidently best treated in this way, while others, such as, for example, the question of feeding grounds, might also have been dealt with quite appropriately in connexion with the individual colonies. The advantages of treating corresponding data from the various breeding places collectively under a common heading are, however, obvious. Some of the facts dealt with have been stated incidentally in Part I, but no harm will be done by the trifling amount of repetition involved.

Unfortunately this section cannot claim to constitute anything even remotely approaching a finished ecological study. Rather it must be regarded as a kind of stock-taking of the

rather disconnected and often incomplete data which have been accumulated up to date. Yet for the majority of British birds so little data of this type is available in a systematized form that it has seemed worth while to publish it, if only as a foundation on which it is hoped more may be built. Many of the subjects touched upon here have been dealt with in their wider aspect for Great Britain as a whole in the Report on the British Birds Census of Heronries.[1] It should be remembered that what is said here is not always or necessarily of more than local applicability, the present study being concerned essentially with the conditions found in one particular county of south-western England.

Before proceeding to review the special local data it may be appropriate to place on record a few conclusions of a more general character which have impressed themselves on the writer, largely as the result of the experience gained in the 1928 census, which may not be without some practical value to others undertaking similar investigations. One is that, except when the young are well-grown, any normally cautious observer paying only one visit to any but the very smallest heronry and not carrying out intensive observations, will almost certainly *underestimate* the number of pairs breeding. There are several reasons why this should be so. One of the chief is the astonishingly small and flimsy construction of some nests which are nevertheless occupied. Some of the smallest and flimsiest nests seen in 1928, which no one without direct proof to that effect would venture to count as occupied, were found to be in use. Some which from appearances would have been regarded as, at most, in an early stage of building or possibly only experimental constructions, were found on observation not only to be complete, but judging from the behaviour of the owners, practically certain to contain eggs. It is possible that such nests are added to during the course of incubation, but the fact remains that there may be actually eggs in a nest which no one on a mere inspection from below would venture to presume to be in occupation.

Again, there is great variability in the shyness (or the reverse)

[1] E. M. Nicholson, *British Birds*, xxii (1929), 334–372.

of individual birds. Some after being flushed return with great readiness, others only with hesitation after a long interval. The nests of some of the shier individuals would often be presumed to be old or deserted but for prolonged observation. In some cases one may return again and again to a given nest and see no sign of the owner, and yet it may prove to be occupied all the time. Such differences are not merely fortuitous ; it might be supposed that on any occasion a certain number of the birds, once they were flushed, would go off to feed or stretch their wings, while others, having perhaps been off more recently, would be anxious to settle down again quickly, and that the individuals which remained away longer would be different on different occasions. It can, however, easily be shown by observation that the birds which come back quickly and those that take alarm easily and do not readily return are always the same. No doubt the differences are dependent in part on the state of incubation of the eggs, but there can be no doubt whatever that they are also due in large measure to real temperamental differences in the birds.

Another factor which must not be overlooked in connexion with census work is the relatively late date up to which new nests may go on being added. In consequence of this it is necessary to carry on observations until at least the latter part of April in order to be certain that the exact total of breeding pairs in any given colony has been ascertained. Fuller details in this connexion will be found on p. 76.

With these preliminary considerations we may pass on to review the bionomical and ecological data available for our own county.

Feeding Grounds and Foraging Range

The feeding grounds of the principal colonies can in all cases be easily indicated in a broad way and in a few instances can be defined with some precision, but systematic observations to determine accurately the feeding range of each of the regular heronries would be well worth undertaking by any observer with the requisite leisure. The facts at present available are tabulated below.

SOMERTON. The principal foraging area is Sedgemoor. The main feeding grounds according to Mr. Pretor-Pinney would be about five miles away from the heronry in a westerly direction and also on King's Moor, an offshoot of Sedgemoor to the south. Sedgemoor, however, is only the main part of a well-watered lowland tract extending almost uninterruptedly from Somerton to the sea twenty miles away, and there is no definite evidence as to how far away over this area the birds may range for feeding purposes.

HALSWELL PARK. Chief feeding grounds are the lowlands to the east and north, from about three miles distance upwards, and no doubt also the Vale of Taunton. The most distant feeding ground is probably the Bristol Channel coast at about eight miles. Further precise observations lacking.

BANWELL. The feeding grounds are the lowlands on both sides of the Mendips from under a quarter of a mile distant to the Bristol Channel shore five or six miles away. The birds may range farther, but on this point there is no definite evidence ; probably they do not habitually go much farther, since the above area provides plenty of food close at hand.

BROCKLEY. The main feeding grounds are the neighbouring marshy lowlands from about a quarter of a mile distant to the Bristol Channel coast (5½ miles) and Blagdon Reservoir (4½ miles). Birds may be observed coming in from both directions, as was also reported to the Heron Census by Mr. Tetley. Barrow Reservoirs (4 miles) are also visited, but according to my experience not to any marked extent.

FIVEHEAD. Chief feeding ground West Sedgemoor, from immediately below the heronry onwards. Some are also believed to go to Curry Moor (*c.* 3 miles) and to Aller Moor, near Langport (*c.* 4 miles) (*Rev. C. J. Pring*).

ALLER'S WOOD. Chief source of food supply is the Exmoor streams from under a quarter of a mile distant upwards, also an old pond in Pixton Park (also under a quarter of a mile) (*F. Goss*). How far away the birds range is uncertain, but Herons may be commonly seen on the coast at Dunster, twelve miles away. Half a dozen or so may be observed at times, which is more than can be accounted for by the odd pair or two that breed near Dunster in some years, and unless they are non-breeding birds they must come from Dulverton or from Withypool, which is practically as far.

SHAPWICK. Here the heronry is actually *in* the feeding territory, namely the mid-Somerset Peat Moors, but there is no evidence as to how far away the birds range.

MARSTON PARK. One of the feeding places is the lake only a few hundred yards away. Birds seen at Mells (4½ miles) are also probably from here, and Mr. Snelgrove informs me that they also

spend a good deal of their time around the Duke of Somerset's fishing pond at Witham and can be seen passing to and fro. These waters and the streams of the district are evidently the main sources of food supply.

Summarizing, it may be said that the Somerset heronries are all either in or very close to the feeding territories. It is sometimes asserted, not without some grounds, that Herons tend to avoid feeding in the immediate vicinity of the breeding place, even when food is available.[1] In the case of some of the colonies now under consideration—e.g. Brockley, Aller's Wood, Marston, etc., there is ample observational evidence that the birds get a good deal of their food quite close at hand (i.e. to within a quarter of a mile), though at any rate in the first case it is well established that equally or more important feeding grounds exist several miles away. So far as the evidence goes an average range of the order of about five miles from the heronry seems to be most usual, but in the case of the Exmoor birds there is good circumstantial evidence of a range up to twelve miles.

Food

At all the colonies foraging in the lowlands of Central and North Somerset eels, frogs, and voles seem to bulk largely in the diet. It is not always realized how very largely Water Voles (*Arvicola amphibius*) are eaten by Herons. The quantity which must be destroyed is amazing, a large proportion of pellets often consisting almost exclusively of fur of this animal. Out of thirty-one pellets from Brockley carefully analysed by Mr. L. A. Hawkins twenty-four contained remains of Water Voles, while about a dozen pellets sent me from Halswell by Keeper W. Thomas yielded practically nothing else, except a few elytra and other fragments of water-beetles. No doubt fish bones are very largely digested, while fur is not, which will have the effect

[1] In this connexion it is of interest to note that the late Sir J. F. F. Horner informed Wiglesworth, in a letter now in my possession, that before the Herons took to breeding at Mells they were commonly to be seen fishing in the lake there and that this was also the case after they abandoned the place as a breeding site, but that while they bred there they were rarely seen at the lake, going clear away to feed.

of causing the castings to give a somewhat exaggerated impression of the extent to which small mammals bulk in the diet, yet even so it is evident that the latter must be a very favourite article of food.

At Somerton Mr. Pretor-Pinney gives 'eels, frogs, and water-rats'[1] as the staple diet and has observed a whole Water Vole disgorged by a bird at the heronry, while at Shapwick Mr. Lewis notes 'eels, frogs, toads and rats'. The same observer has twice seen a Heron on the Peat Moors swallow a Grass-Snake (*Brit. Birds*, xxii, 1928, p. 65; and xxiii, 1929, p. 38), so that apparently this habit is not unusual in that district. At Brockley, Banwell and Halswell Park it is apparent from the feeding range of the birds that small sea fish, molluscs, and other marine organisms must enter into the diet to some extent. At the first-named colony Mr. H. Tetley states that many remains of trout, presumably from Blagdon, can be found on the ground when the young are fairly large, but Mr. Hawkins found fish remains almost completely absent from pellets collected there in April and May. Mr. Hawkins's data are much the most complete for any heronry in the county and are given in full in the accompanying table, but it may be convenient also to sum up the results here in a few lines. The figures refer to the number of pellets in which remains occur.[2]

Water-Vole, 24 (1 whole hind-quarters, 8 fur only, 1 fur, claws and teeth, 12 fur and claws, 2 fur and teeth); *Colymbetes fuscus*, 14; Dytiscidae, 10 (+ 3 ?); *Hydrophilus piceus*, 1; *Cercyon*, 1; *Geotrupes* (?), 1; other Coleoptera remains, 5; *Notonecta*, 9; Dragonfly, 1; other insect remains, 5; a caddis case, 1; *Pyramidula rotundata* (land snail), 1; part of fish about 6 in. long, 1. Fur, teeth and bones of a Long-tailed Field-Mouse (*Apodemus sylvaticus*) were found in one pellet, the attribution of which to a Heron was not, however, quite certain.

At Dulverton also trout are undoubtedly eaten to a considerable extent and are considered by Mr. F. Goss to constitute the main food, but frogs, voles, etc., are also taken freely and the same observer states that two or three birds can always be

[1] The terms 'Water Rat' and 'Water Vole' are, of course, synonymous.

[2] In the Heron Census Report (*loc. cit.*, p. 344) minor slips in the numbers have been made in one or two cases.

Mr. L. A. Hawkins's Analysis of Pellets from Brockley

No.	Date.	Water Vole.			Insects.			Vegetable matter.	Weight (grains).	Other remains, remarks, etc.
		Fur.	Claws.	Teeth.	C. fuscus.	Dytiscidae.	Notonecta.			
1	21.4.28	+	—	—	+	—	—	—	249	
2	21.4.28	+	+[1]	+[1]	+2	+	+	—	267	
3	23.4.28	+	+	—	+	+	—	+	50	Smaller beetle.
4	23.4.28	+	—	+	—	—	—	+	245	Insects.
5	23.4.28	+	—	—	+	+?	—	—	22	
6	23.4.28	+	+	—	—	+	—	—	—	?*Geotrupes*(Coleoptera).
7	23.4.28	+	+	—	+	+?	—	—	77	
8	23.4.28	—	—	—	+3	+3	+	+	30	Caddis case; beetle elytron.
9	5.5.28	—	—	—	—	—	—	—	—	Portion of a fish about 6 in. long.
10	23.4.28	+	—	+	—	—	—	—	188	Elytron of *Cercyon* (Coleoptera) and other remains of insecta.
11	23.4.28	—	—	—	+	—	+	—	—	Insecta.
12	23.4.28	+	+	—	—	+	+	+	255	
13	23.4.28	+	+	—	—	—	+	—	170	
14	23.4.28	+	+	—	+2	—	+	—	67	Heads of insects; bones of —-?
15	12.5.28	—	—	—	—	—	—	—	—	Elytron of *Hydrophilus piceus* detached in carriage from a pellet of this date.
16	23.4.28	+	—	—	—	—	—	—	250	
17	5.5.28	—	—	—	—	—	—	—	—	Hind quarters of Water Vole.
18	5.5.28	+	+13	—	—	—	—	—	182	Insects.
19	5.5.28	+	—	—	+	+	+3	—	130	
20	5.5.28	+	—	—	—	+	—	+	35	Other Coleoptera (? vertebra of fish).
21	5.5.28	—	—	—	+	+	+	—	75	
[22	12.5.28	—	—	—	—	—	—	—	52	Fur, teeth and bones of Long-tailed Field Mouse. External appearance of pellet was recorded as more like Owl's than typical Heron's. This may have been due to difference in the fur of which it was composed, but origin cannot be considered quite certain.]
23	12.5.28	—	—	—	+4	—	—	+	—	Coleoptera remains.
24	29.5.28	+	+	—	+4–6	+	+	—	69	
25	29.5.28	+	+	—	—	—	—	—	40	
26	29.5.28	+	+	—	+5	—	—	+	40	
27	29.5.28	+	—	—	—	—	—	—	13	
28	29.5.28	+	+	—	—	+?	—	+	30	
29	29.5.28	+	+	—	+6	—	—	—	189	Dragonfly & Coleoptera.
30	29.5.28	+	—	—	—	+	—	+	60	*Pyramidula rotundata* (snail).
31	29.5.28	+	—	—	—	—	—	—	49	
Totals	..	23	13	3	14	10 (+3?)	9	9	—	

[1] Presumed Water-Vole.

seen at an old pond in Pixton Park where there are no fish. At Marston Park the Herons were almost certainly responsible for numerous empty shells of the Freshwater Mussel (*Anodonta cygnea*) which I found round the lake ; indeed the fact that I even found one such shell under the nest trees well away from the lake leaves hardly any doubt of this.

Distribution of Heronries (Plate XIII)

Turning now to consider the distribution of heronries in the county, which can be readily visualized by reference to the accompanying map, we find that on the whole this is very much what might have been anticipated from a consideration of the nature of the country and the habits of the birds. The richest feeding grounds are undoubtedly the alluvial moors which occupy the major part of Central and North-west Somerset, and seven out of the eight principal heronries are related to this area. Plenty of good breeding sites are available, so that none of the colonies are far away from the feeding grounds, and between them the whole of the available foraging area is probably pretty well covered. Brockley is related to the North Marsh, Banwell to the more southerly part of this and evidently, to some extent at least, to the levels on the other side of the Mendips, Shapwick to the peat moor country (north of the Poldens), Somerton and Etsome to Sedgemoor (south of the Poldens), Fivehead to the more southerly moors (West Sedgemoor, etc.), and Halswell Park to the more westerly lowlands.

The remainder of the county, that is to say the whole of West, East and North Somerset (apart from the North Marsh) and a narrower strip along the southern and south-eastern borders, is predominantly above, and much of it considerably above, the 250 foot contour, and here, with the exception of two areas, there are no heronries. The two areas in question are Exmoor, which is rich in trout streams, and the Frome district, in which neighbourhood it is probably not without significance that there are more ornamental waters than anywhere else in the county. The fact that Herons have bred regularly in this district for many years (Mells and its successor, Marston, and Longleat, just over the border) is sufficient evidence that it possesses

advantages not shared by the large area between the Mendips and the Avon, which is, in fact, rather poor in streams and poorer in fish, and in which there is no evidence of so much as even a single pair of Herons having bred at any time.

Altitudes of Heronries

Altitude probably plays little if any direct part in influencing the selection of breeding places, which are probably determined primarily by general suitability of sites coupled with reasonable ease of access to the feeding grounds. There is no necessary correlation between the level of the feeding grounds and the altitude of the heronry. Heronries related essentially to the alluvial flats may be on relatively elevated ground adjacent, chiefly no doubt because the flats are not so well timbered. It is probable, therefore, that not much importance is to be attached to the exact elevations at which heronries occur, yet a list showing the approximate altitudes in feet of the various Somerset heronries may be of some interest. This is as follows :

Exford, 950 ; Withypool, 800 ; Aller's Wood, Dulverton, 450 ; Halswell Park, 400 ; Marston Park, 260 ; Banwell, 250 ; Fivehead, 200 ; Somerton, 150–200 ; Etsome Wood, 190 ; Brockley, 150 ; Shapwick, 50.

The Exford site is perhaps the highest in Great Britain ; at any rate it is nearly 200 ft. higher than any other of which the altitude was reported to the Heron Census.

Species of Trees Occupied

The species of trees occupied and the numbers of nests in each tree in 1928 are recorded in the accounts of the individual heronries, so that it is unnecessary here to do more than summarize. Four out of the ten regular heronries are entirely in conifers and slightly over a quarter of the total number of nests in 1928 were in trees of this class, while the other colonies are wholly or almost wholly in deciduous trees.[1] The oak, as

[1] In this connexion it may be interesting to note that the Forestry Commission *Report on Census of Woodlands and Census of Home-grown Timber, 1924* (1928), gives the following acreages of woodland in Somerset : Conifers, 8,579 acres ; Hardwoods, (*a*) High forest, 7,094 acres, (*b*) Coppice, 40,680 acres ; Mixed hardwoods and conifers, 4,703 acres.

in England as a whole, is easily the most favoured single species, though this is perhaps more due to the fact that it is about the commonest tree of deciduous woodland, than to any peculiar advantages over several other species which are also popular. Fourteen of the thirty occupied trees at Somerton in 1928 were oaks and seven ash. At Brockley the nests were in four ashes and five oaks, while Fivehead is almost wholly in oaks (19 out of 21 in 1928), as are the smaller colonies at Marston and Withypool. One nest only at Halswell in 1928 was in an oak, and the nest at Exford was in an ash in 1929. Beeches predominate at Halswell Park, which, however, was formerly wholly or mainly in conifers (Scots pine and spruce), and several beeches (3 in both 1928 and 1929) are occupied at Somerton. Wych elm (4–5) and sycamore (1 in 1928) occur at the latter place only, and alders (2) only at the now deserted Edington site. Banwell is in Scots pines, Aller's Wood in spruces and Etsome Wood in spruce and larch, while odd conifers containing nests occur in the heronries at Halswell (3 spruces, of which two were dead, in 1928) and Fivehead (1 Scots pine and 1 larch in 1928).

The preferences, such as they are, are shown in the following table. If we go by the percentage of each species in the total number of trees containing occupied nests (in 1928), Scots pine is a fair second to oak, with beech, spruce and ash taking the following places in descending order, but if we take the percentage of the total number of occupied nests in each species of tree, beech is second, with ash and Scots pine equal third. The difference is of course due to the fact that single specimens of large spreading trees like oak, beech and ash can and often do accommodate many more nests than can be got into a conifer.

Trees in order of preference on basis of percentage of nests in each species in 1928.[1]

		Percentage of nests.
1.	Oak	33.7
2.	Beech	24.2
3.	Ash / Scots pine	13.9
4.	Spruce	6.6
5.	Wych elm	4.8
6.	Larch	1.8
7.	Alder	.73
8.	Sycamore	.37

Trees in order of preference on basis of percentage of each in the total of occupied trees in 1928.

		Percentage.
1.	Oak	31.1
2.	Scots pine	23.2
3.	Beech	17.2
4.	Spruce	11.9
5.	Ash	7.9
6.	Wych elm / Larch	3.3
7.	Alder	1.32
8.	Sycamore	.66

Amongst the deserted sites recorded in Part I it may be noted that the nests at Knowle, Mells, Uphill and Christon were in Scots pine, in Conygar Tower Wood in larches, at Carhampton in a Douglas fir, on Grabbist and Avill Ball in unspecified conifers, in Butleigh Wood (second establishment) in oaks, at Warleigh in wych elms, and at Blue Anchor in a poplar. The 1930 nest in an apple-tree (p. 65) is possibly unique.

Breeding Dates

Although the data here are unfortunately quite imperfect some points of interest have been noted. There is evidence of a quite distinct variation in breeding dates as between different colonies, a variation which apparently cannot be attributed wholly to situation. At Fivehead on March 25, 1928, the calls of recently hatched young were heard from two nests, though at Shapwick and Somerton on the 23rd and 24th and at Aller's Wood on the 25th and Halswell Park on the 30th no evidence of any young being hatched was obtained. On April 12 at Brockley young were noted for certain in four nests, in one case well-grown, and they were certainly hatched in several others.

[1] The figures are based on the numbers and distribution of nests on the dates when the various colonies were visited by the author. In one or two instances a few extra nests were subsequently added for which the requisite details are not available, but they are too few materially to affect the figures. In the case of Somerton 99 nests are reckoned as new for the purposes of the table, this being the number remaining after the deduction of 12 practically certainly old nests from the total of 111.

On April 13 it was evident that quite a number were hatched at Banwell (though unfortunately, in view of Mr. Lewis's very low estimate of the number of pairs which eventually bred, I did not determine the number of nests in which they were distributed); yet on April 14 young were only hatched in an extremely small proportion of nests in the comparatively large heronry at Halswell Park.

The late date up to which new nests continue to be built is noteworthy, and the observations in 1928 were sufficient to prove positively that in a number of cases this is not due to the destruction or desertion of any previous nest. At Somerton birds were still building up to at least about April 12 (*cf.* Pt. I, p. 66), while at Halswell Park between March 30 and April 14 not less than eight new nests were added by pairs not in occupation on the earlier date. At Brockley five (or possibly six) nests were added after April 11. One of these is believed to have been a second attempt, but one was certainly and the others very probably the first nests of the season of their respective owners (*cf.* Pt. I, p. 74). This late building of certain pairs seems to be a common phenomenon in many, if not most, heronries.

With regard to the date of arrival at the heronry precise particulars are available only in the case of Somerton, where the earliest arrivals appear with considerable regularity in the first week of February (*cf.* Pt. I, p. 68). The first bird was noticed in 1927 on Feb. 4, in 1928 on Feb. 6, and in 1930 on Feb. 3.

Number of Eggs and Young

Correspondents of the Heron Census were asked when possible to provide data on the number of eggs in the clutch, numbers of young reared, and so on. Little exact information was obtained for Somerset. At Shapwick Mr. Lewis finds a clutch of three 'very usual', and at Banwell the same observer reports 'five uncommon; oftener three than four'. At Fivehead one nest examined by the Rev. C. J. Pring on April 18, 1923, contained three eggs, while two examined on March 24, 1927, contained three and four respectively. On March 31, 1928, when young

were hatched in several nests, Mr. Pring noted that two had shells of four eggs below them, two the shells of two eggs and one the shell of one.

At Brockley in 1928 the observations indicate that four (or perhaps five) broods of three and at least five of two were reared, while one brood of two died. Details were not obtained for all nests.

Second Broods

In 1928 Mr. William Thomas, gamekeeper to Lord Wharton, informed me that from his observations he was certain that second broods were sometimes reared at Halswell Park, and on August 29, 1930, he obligingly wrote to tell me that one nest had had two broods reared in it that season. At that date the second brood were still in the nest, being then ' big, fine birds ', which were shortly expected to fly. This was the only case in 1930. In reply to further questions Mr. Thomas wrote that he believed that it was 1927 or '28 that he first definitely noticed instances of two broods being reared in the same nest, and on that occasion there were ' four or five nests with the second lot '.

Movements

The only definite piece of evidence bearing on movements which can be quoted is a case of a Heron ringed as a young bird at Horton Spinney, Otmoor, Oxfordshire, on May 19, 1927, which was reported near Weston-super-Mare on December 17 of the same year (*Brit. Birds*, xxi, 295). Assuming that this case was not exceptional, which there is no reason to suppose it was, it indicates that the Heron population of the county in winter does not consist exclusively of local birds. To what extent and how far the latter may disperse outside the breeding season is at present quite unknown.

Relations with Rooks

The occurrence of rookeries in more or less close association with heronries is almost too frequent to be dismissed as purely fortuitous, though the explanation is by no means clear. Still

more curious is the variability in the attitude of the two species to one another where they breed together. Particulars of such associations in Somerset are given under the respective heronries concerned in Part I (to which the page references below refer), and not all of the details there given need be quoted again here.

At Somerton (p. 67) the Herons, when they migrated from Kingsdon, established themselves in trees already occupied by a large rookery. Constant fighting is stated to have occurred, but it was only after nearly fifty years that the Rooks eventually abandoned the wood.

At Brockley (p. 74) Rooks and Herons have bred together for many years past and appear to have been always tolerant of one another, nothing more than minor squabbles having ever been observed. At the present time, however, there seems to be a greater tendency to segregation than formerly, the main rookery being some hundred yards from the heronry, though a small number of Rooks still breed actually amongst the Herons. In 1928 the principal nest tree contained seven occupied Herons' nests and about ten Rooks'.

At Shapwick (p. 80) there is a small rookery at the corner of the copse, but some hundred yards from the Herons' nests and there appears to be no friction. The same is true in the case of Aller's Wood (p. 79), though here rookery and heronry are perhaps hardly close enough for any collision to be even likely.

At Exford (p. 83) in or about 1918 a pair of Herons, driven from their previous breeding site by timber-felling, were prevented by Rooks from establishing themselves in some trees in or near which there was already a small rookery.

Relations with Crows and Predatory Birds

At the present time, apart from Man, the Heron has practically no serious enemies. One of the very few of any importance is the Carrion-Crow, whose egg-sucking propensities may at times be a serious menace. At Fivehead, at least in the early years after its discovery, the heronry was much harried by Crows, which were evidently responsible for its temporary desertion in 1924. Fuller details will be found in Part I, p. 76. Since the enlargement of the colony which followed its re-

establishment serious depredations by Crows do not appear to have been noted.

At Somerton Mr. Pretor-Pinney states that some difficulty is experienced in keeping the Carrion-Crows from sucking the eggs when the birds are off, but it is evident that the protection afforded is effective in preventing any serious damage. No evidence is forthcoming of any significant depredations by Crows at any of the other sites.

In the days of Falconry the Heron was a recognised quarry, but nowadays it is rare to hear of Herons being killed by wild Peregrines. I am aware of only one definite record of such an occurrence in Somerset, a case of a Heron attacked and killed by a pair of Peregrines above a Somerset peat marsh having been communicated by the late Mr. F. H. Symonds to Mr. R. H. Brown and recorded in the Supplementary Report on the *British Birds* Census of Heronries.[1]

At Halswell Park I have watched the sitting Herons harried by a Buzzard. The bird kept sweeping down over the nests and caused a great deal of noise and commotion amongst the Herons. Two or more of the sitting birds actually reared up and lunged at it as it swooped down at them. No doubt it was ready to pick up any unguarded nestling, yet it was difficult to resist the impression that it was also deriving a certain satisfaction from tormenting the larger birds half in play. After a considerable time it left without having done any damage. This was on April 14, when not very many young were hatched.

Mr. J. Snelgrove reports a possibly analogous case of a Kestrel mobbing a Heron at Marston Bigott. When first seen the Heron was flying ahead, squawking, pursued by the smaller bird, but suddenly it turned and rushed at the Kestrel, which flew away and started hovering. 'The next day they were fighting again, making a terrific noise', so that a neighbour rushed out, thinking her fowls were being attacked. On this occasion also the Heron drove off its small adversary. This would appear to be a case of pure tormenting, recalling the way in which Peregrines will sometimes torment a Raven.

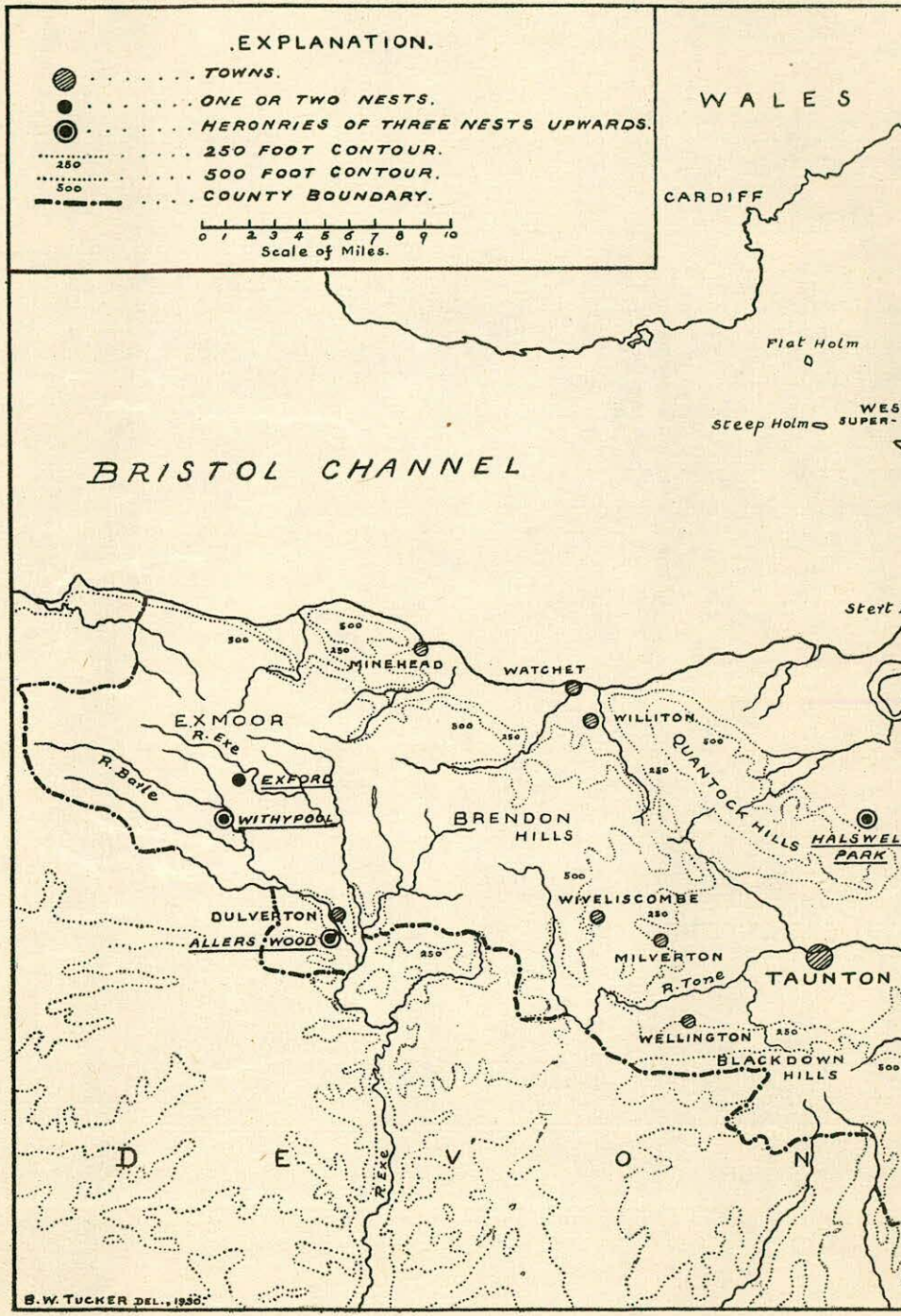
[1] *British Birds*, xxiii (1930), p. 335.

Destruction

In Somerset, though the taking of Herons' eggs is illegal under the 1929 order, the birds themselves are not formally protected by law, yet in the county as a whole they are very little interfered with by Man. At most of the more important breeding places, such as Brockley, Banwell, Somerton and Aller's Wood, the nesting birds are effectively protected by the owners, while at others, such as Marston, Fivehead, and Shapwick, although the land-owners have not as far as is known evinced any active interest in their Herons, they are not interfered with. Over the greater part of the area it is quite an abnormal occurrence for a Heron to be shot.

It is only in the West in connexion with the trout fishing that there is any regular or habitual destruction of Herons. The failure of the birds to establish themselves at the site near Williton, where they are protected by the owner, is almost certainly due to shooting elsewhere in the district, chiefly, it is believed, on a single estate. It is in the Dulverton district that the principal toll is taken, but even here, though ornithologists would be glad to see it cease altogether, the destruction can hardly be considered a serious factor. The birds are protected at the breeding place and have maintained their numbers at about the same level for many years, though it is true that they have not significantly increased, as they might have done. Mr. Fred Goss estimates the number shot round about Dulverton at about twenty a year, probably not more, and from careful independent enquiries I am satisfied that this can be safely accepted as a maximum figure, particulars in my possession kindly supplied from an authoritative source suggesting, in fact, that the average figure is probably not much over ten. From time to time others are shot further afield. Thus, Mr. Grubb was informed that four had been killed in 1930 at Withypool, while a couple were shot at Exford some years ago and a similar fate seems to have overtaken at least one of the local pair in the past year. These more or less sporadic cases of shooting in the Exmoor district must also be attributed directly or indirectly to the influence of fishing interests.

It would be idle to minimize the damage done by Herons to



MAP OF SOMERSET ILLUSTRATING TH

DISTRIBUTION OF HERONRIES, 1928-30.

trout, and instances of their unfortunate weakness for killing fish too large for them to swallow—especially when the big fish are up on the spawning beds—are well authenticated in the Dulverton district. I have received particulars of a recent case where a Heron in one night stabbed and either killed or fatally injured no less than fourteen fish of one to three pounds weight. It is thus not to be wondered at that when Herons make a habit of visiting trout hatcheries and such places they meet with a hot reception, but the general policy of shooting or subsidizing the shooting of birds at random anywhere where they are met with all over a fishing district is quite futile, since it is a matter of observation that the losses are promptly made good from outside, it being evident from information collected in the 1928 Heron Census that 'even in counties where the entire breeding stock has been annihilated by the gun . . . the Heron population, far from vanishing, remains almost, if not quite, as abundant as before'. We cannot enter here into all the *pros* and *cons* of the question of the protection of the Heron and the effective safeguarding of fishing interests against it, but may refer to the extremely well-balanced and level-headed discussion on this subject in the *British Birds* Heron Census Report,[1] which may be cordially commended to the careful consideration of fishermen and ardent protectionists alike.

Non-Breeding Birds

The question of non-breeding birds is a difficult one. In some districts of Great Britain good evidence has been obtained of a more or less considerable non-breeding population.[2] In some instances the conclusion is based on direct evidence, birds being regularly observed about the heronry which take no part in breeding operations, in others it is legitimately inferred from the constant presence of Herons in the breeding season in districts or places—e.g. some of the Scottish Isles—where there are known to be no heronries. In Somerset no evidence at all of the former type has been obtained, while evidence of the latter class can hardly be looked for in a county where scarcely

[1] *Loc. cit.*, pp. 368–9. [2] *Loc. cit.*, p. 352.

any point is more than about thirteen miles from some established breeding place. But my general experience leaves me in little doubt that any non-breeding population which may exist in the county at the present time is an insignificant percentage of the whole.

Population

The breeding population of Herons in Somerset was estimated by Wiglesworth in 1918 at not more than about 126 pairs. With the information now at our disposal we may conjecture that the actual number was nearer 150, but the history of individual colonies up to that date warranted the conclusion which he drew, that the Heron was a diminishing species in Somerset. This was attributed primarily to the influence of fishing interests, though at the date in question war-time timber-felling appeared likely also to become a serious factor. Since the war, however, and especially, it would seem, in the last few years, a striking increase has taken place. There is little reason to suppose that the attitude of fishermen towards the Heron has undergone any radical change in the last decade, and evidently other factors were involved in the recent increase, as they probably were also in the antecedent reduction. But whatever the causes may have been the increase in recent years has been remarkable. The 1918 figure has nearly doubled. The 1928 Heron Census gave the breeding population of the county as 273–280 pairs. This was the second highest county total for Great Britain, being only exceeded by Norfolk (331–351 pairs), while Sussex (268–276 pairs) was practically the same.

It is necessary to observe, however, that the breeding population of the county in 1928 was without doubt somewhat abnormally high. The number at Somerton, though not determined quite exactly, certainly exceeded any previously recorded, while several colonies, such as Banwell, Fivehead, and Shapwick, underwent spectacular increases, and the numbers at the other sites were all on the high side. In 1930, possibly in part—though we can hardly suppose entirely—on account of the hard weather in the early spring, there was a considerable drop, probably to distinctly below the average of

the last few years. At the colonies which were most strikingly augmented in 1928 the increases have been satisfactorily maintained, but others, such as Somerton, Brockley and Aller's Wood, have reverted to about the average of recent years (in the first case possibly rather below it), while Halswell Park, for no obvious reason, has dropped rather badly, from about fifty to only a little over thirty. Unfortunately we have not quite complete figures for either 1929 or 1930, but the number of breeding pairs can be estimated at about 215 in 1929 and about 220 in 1930. We may anticipate a slight increase in the next year or two with some confidence and may perhaps venture the opinion that unless unpredictable influences result in any unexpectedly large increase or decrease in the next few years, a figure of about 240–250 pairs (not more) will be found to represent about the average under present conditions. In any case unless the Sussex figure was also exceptionally high in 1928 and was also followed by a marked drop in the following years,[1] it seems fairly certain that the normal position of Somerset at the present time in respect of total Heron population should be third in the county list, immediately following instead of immediately preceding Sussex.

With regard to actual density of population, as opposed to total numbers, this was actually greater in 1928 in Somerset than in Norfolk, the census figures giving a density of one pair to approximately 3,759 acres, this being only surpassed by Sussex with one pair to 3,428 acres. But if the 1928 totals for the other counties can be accepted as fair averages, the 1930 figures for Somerset (one breeding pair to about 4,716 acres) would bring it down to the last place amongst the seven counties with a density of one pair to less than 5,000 acres, while if the opinion expressed above as to the probable average population is confirmed this would bring it up to fifth. Two of the counties, however, which precede it under this arrangement, namely Dorset and Northants, are so much smaller that the comparison is hardly worth much. Of the counties over 900,000 acres in area Somerset, even on the basis of the present rather lowered total, is substantially exceeded in density of Heron population

[1] Evidence is not available on this point.

only by Sussex and Norfolk, while the density in Essex, though in 1928 it exceeded the 1930 figure for our own county, is probably well below that of Somerset as a rule.

Conclusion

It will be apparent from what has been said above that the present status of this imposing bird in our county is such as to give ground, on the whole, for considerable satisfaction not alone to Somerset ornithologists, but to that wider public which, without specialized knowledge, takes pride and pleasure in the heritage of the beauties of our native scenery and wild life.

In thanking once more the many correspondents and informants who have helped to make this survey possible the author would like to emphasize at the same time how large a field for investigation still remains even in connexion with this one species. It may be considered highly improbable that any substantial heronry remains to be discovered in the county, though the recent accidental finding of the well-established little colony at Withypool illustrates how unsafe it is to be too confident that no odd nests or groups of two or three nests have escaped notice in the remoter districts. But there are many aspects of the local Natural History of the species which it has only been possible to treat very inadequately and which require working out much more fully, while there are other problems of a more general character about which hardly anything is known at all. Do adjacent heronries, for example, observe any sort of mutual limits in their feeding territories or do birds from both range at random over the neighbouring ground ? Is there normally any interchange between heronries or is each a self-contained unit ? To what extent do the winter and summer populations differ in respect of the component individuals ? Such problems are in general far less easy of solution than most of those dealt with here, but intensive observation, especially in conjunction with marking experiments on a sufficient scale, may settle them in time.