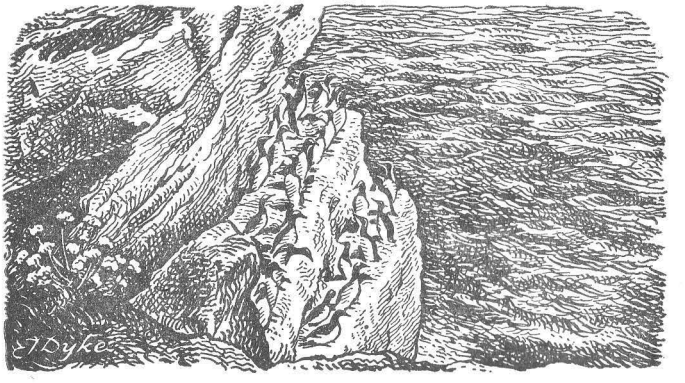


COUNTS OF NESTING SEA-BIRDS

Work this year was mainly devoted to the following tasks: (1) repeated counts of all species on two selected sample areas, (2) an attempt at a census of gulls, (3) the study of seasonal and diurnal changes in the numbers of auks. In addition, counts of the birds of Gannets' Rock were made and a large sample of Guillemots examined for 'bridled' individuals.

1. The two sample areas chosen were the south-west (from Goat Island to the Rattles), and an area roughly centred on St James's Stone.

Counts in the South-west were made on March 19th, April 30th, June 8th and July 7th. Table I records the results and includes also figures for this area for 1939 (from R. Perry, *Lundy, Isle of Puffins*), July 9th, 1942 (due to W. B. Alexander *et al*), and July 2nd, 1948. All this year's counts were made in mid-morning and by the writer, except for July 7th. On that date counts were made in both the morning and early afternoon, the first being carried out by Miss M. Spinks and A. D. G. Smart. The 1949 figures are maxima excluding the March count.

TABLE I.—Birds in the South-West Area

	Mar. 19	April 30	June 8	July 7 a.m.	July 7 p.m.	1949	July 1948	July 1942	1939
Cormorant	0	0	0		1	1	1	1	0
Shag	26	16	50	34	47	50	32	43	72
Oyster-Catcher	4	4	0	0	2	4	2	2	4
Herring Gull	196	336	348	171	266	348	171	464	1000
Lesser Black-back	7	21	18	11	15	21	14	1	2
Great Black-back	31	19	21	20	26	26	20	16	26
Kittiwake	0	0	0	0	0	0	0	84	80
Razorbill	0	55	255	415	207	415	290	364	1390
Guillemot	0	5	137	13	59	137	116	265	1010
Puffin	0	0	1	5	3	5	0	0	0

Counts of the St James's Stone area were carried out on March 22nd and April 9th, 10th, 16th, 23rd, 24th and 29th. Counts were attempted also on May 12th and 15th but abandoned as impracticable because of the movements of the auks, and no later attempts were made. Table II records the figures obtained, with those of Perry for the same area in 1939. The 1949 figures here are maxima, except where marked * : in these instances they are true totals based on daily visits to this area from May to July.

TABLE II—Birds in the St James's Stone Area

	Mar.	April	April	April	April	April	April	1949	1939
Shag	7	3	6	5	10	7	4	10*	0
Fulmar	1	1	0	1	0	2	0	0*	0
Oyster-Catcher	2	6	2	2	2	5	0	6	0
Herring Gull	228	178	99	211	249	197	284	284	475
Lesser Black-back	7	5	2	10	10	13	8	14*	80
Great Black-back	9	7	0	1	3	4	2	4*	3
Kittiwake	395	423	270	382	677	381	451	677	686
Razorbill	32	72	194	35	156	130	277	277	1170
Guillemot	625	1	694	224	147	442	355	694	4490
Puffin	0	0	1	2	3	1	7	30*	30

2. The 'census' of gulls as in fact carried out scarcely merits the description. Counts were made at least once on all parts of the coast during May and June, and the census figure for each species is merely the sum of these counts. Where, as in the case of the sample areas, several counts were made on any stretch the largest number recorded was used in computing the totals.

	1949	1939 (after Perry)
Herring Gull	2460 birds	3000 pairs
Lesser Black-backed Gull	198 birds	350 pairs
Great Black-backed Gull	97 birds	57 pairs
Kittiwake	2390 (3200)	3000 pairs (nests)

The figure for the Kittiwake given in parentheses is a 'corrected' total based on the attendance of adults at a sample of 600 nests. The counting of nests all round the coast was not attempted, though for this species it is certainly the best means of determining the size of the breeding population.

3. The results already tabulated will serve to indicate crudely the extent of seasonal fluctuations in numbers. The data collected on diurnal changes are too fragmentary to be profitably included here.

4. Gannets' Rock. The following figures are compiled from visits made on June 27th, July 2nd and August 10th, and counts from the island on May 7th and June 20th.

	1949	1948	1939
Cormorant	7 occupied nests	8 nests	11 pairs
Shag	5 nests	4 nests	9 pairs
Fulmar	5 sites with eggs	4 sites with eggs	none
Herring Gull	35 birds	no figure	50 pairs
Great Black-backed Gull	10 birds	(2 pairs)	9 pairs
Kittiwake	7 occupied nests	17 nests (only 7 occupied ?)	25 pairs
Razorbill	100 birds most seen	*c.* 80	280 pairs
Guillemot	220 birds most seen	*c.* 400	290 pairs

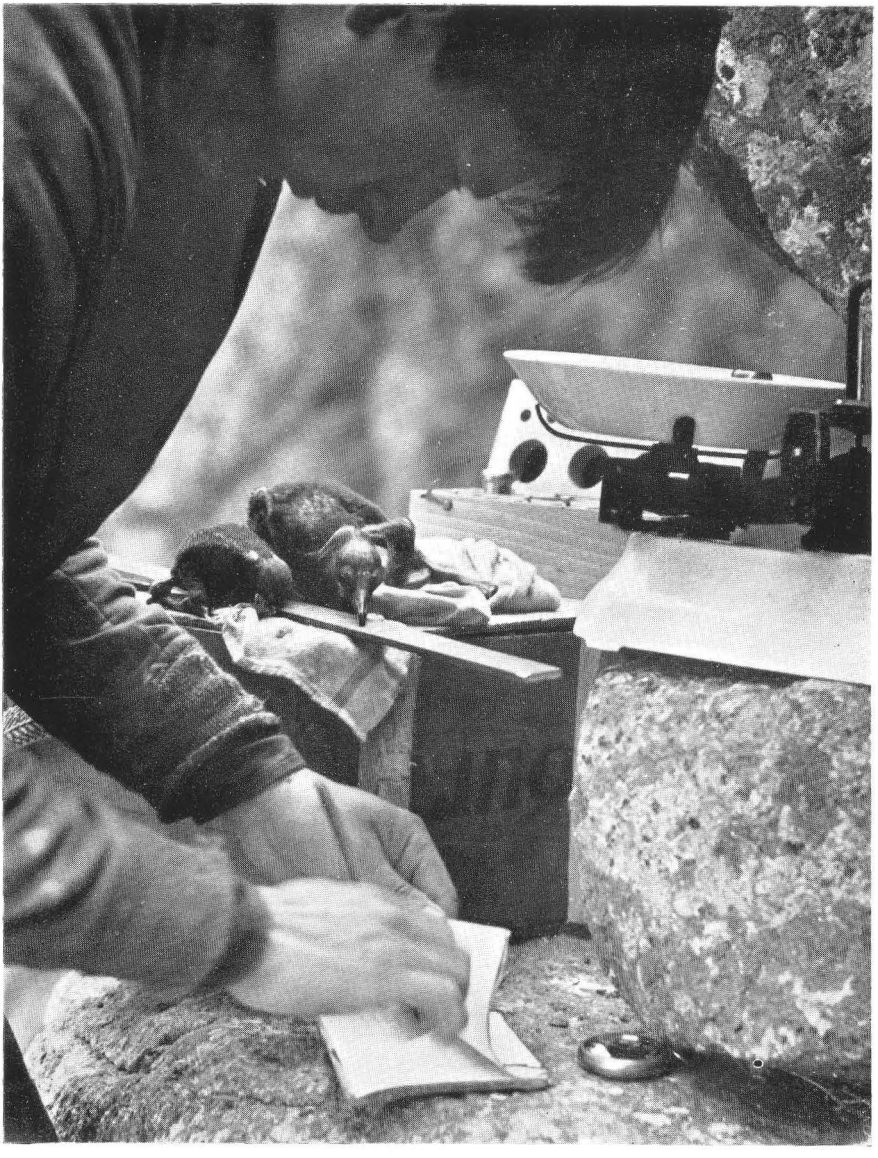
5. During the examination of Guillemots for the presence of 'bridled' birds 3,500 were counted (between May 23rd and July 19th). This total includes every group of birds that could be scrutinized adequately at the time of visiting. Thus, though it has even fewer claims to be a census than the gull counts given above, this figure serves as an indication of the order of the numbers present. It may be said with some confidence that the Guillemot population in 1949 was unlikely to have been in excess of 10,000 birds, as compared with Perry's total of 38,000 in 1939.

Remarks. Two features are outstanding—the great overall decline apparent in the numbers of breeding birds as compared with 1939, and the wide fluctuations in the numbers of several species found in repeated counts on any one area. The latter point need not be laboured. That the numbers present at breeding sites vary greatly during the season and during any day is well known. The present data do little to increase this knowledge, and the most important contribution they make would seem to be the demonstration of the magnitude of the possible error in any census based on single counts of an area.

The apparent decline since 1939, first detected by W. B. Alexander *et al* in 1942, is far too extensive to be ignored. It is certainly possible, since the 1939 totals were all estimates, that they were in some cases over-estimates, but it seems certain also that the decline cannot be ascribed merely to an error in accounting.

Where comparison between 1948 and 1949 is possible no very abrupt changes are to be found (with the possible exception of the Guillemots on Gannets' Rock). The 1942 figures for the south-west stand in an interestingly intermediate position. The decline of the auks in this region seems to have been checked ; but it is the different trends in the three species of *Larus* that are especially interesting. The decrease of the Herring Gull has continued, the Lesser Black-back may still be increasing (in this small area), while the Great Black-back is almost stationary.

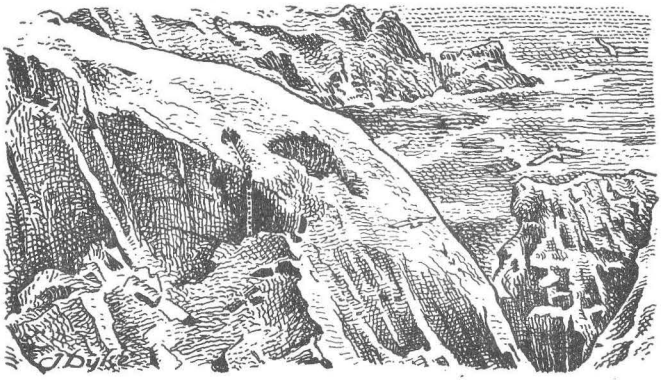
What has caused the decline ? Will it continue ? Can it be arrested, and an increase set in motion ? These are the questions to which we seek answers. As yet we are far from being able to provide them. Several causes of the decline have been mooted : Rats, Oil, Egging, Great Black-backs. All, or none, may be



WEIGHING AND MEASURING YOUNG SHAGS *Photo : G. T. Mack*

important. Answering the second question may provide the best way of answering the others.

The information recorded above shows that the continued study of population trends is needed. It shows too that the methods employed in 1949 were not efficient ; but the season's work should ensure that the investigations of succeeding years show improvement in this respect.



THE GROWTH OF NESTLING SHAGS

During May, June and July I was studying the growth of Shags *Phalacrocorax aristotelis* from hatching to the time of leaving the nest. The objects of the work were to obtain a picture of the general course of growth and development, to compare the rates of growth of various elements of the limbs and body, and to find out something of the development of behaviour-forms. The latter topic did not receive intensive treatment (this was planned for later years) so that little definitive information was secured. A considerable body of data on growth was accumulated, from which the summary that follows presents points of general interest. It is proposed to publish a fuller account elsewhere.

Daily visits were made to a group of three nests and on each occasion the young birds were weighed and measured. It was found impracticable to make use of more than three nests, which was unfortunate, as from the nine eggs laid in these nests only six young hatched and only two survived to the time of deserting the nest.

The growth of the young, measured as change of weight, follows a not-unexpected pattern, closely resembling that found by Portmann for *Pelecanus*, the nearest relative of the Shag so far studied in this way. The incomplete table of weights below indicates the general form.