THE DISTRIBUTION AND NUMBERS OF BREEDING GANNETS (Sula bassana L.).

BY V. C. WYNNE EDWARDS, R. M. LOCKLEY AND H. MORREY SALMON.

The late J. H. Gurney compiled in his book, *The Gannet*, published in 1913, a detailed history of all gannetries of which he could find records, whether they were still occupied or already extinct. He made estimates of the population at that time of each, based in many cases upon personal visits; and though some of the figures he obtained were inevitably less reliable than others, he was finally able to make a first approximation of the entire species at 101,000 birds, excluding all under eight months old (1913, pp. 324-325).

The largest sea-bird in the North Atlantic region would naturally attract unusual attention; but Gurney's census has had particular effect in focussing it upon population studies. Within the last ten years especially many gannetries have been visited by naturalists intent either on revising Gurney's figures or on detecting changes with the passage of time. With one material exception all of them have been re-estimated since 1928, and it seems unlikely that a chance like the present for a second general stocktaking will recur for many years. There are still three colonies about which little or nothing has been learnt since 1913; but populations change and figures soon become out of date, and thus, in view of the large amount of recent information, it seems unwise any longer to defer this summary.

Gurney's list is reproduced in the table below. We follow him in regarding colonies placed on two or more neighbouring islets, as in the St. Kilda group or on the Bird Rocks, as parts of a single unit. Occasionally it is a matter of opinion whether they should be separated or not; the Bull Rock and Little Skellig off the south-west of Ireland, for example, are less than fifteen (nautical) miles apart, but Gurney kept them distinct. On this reckoning Gurney knew of fourteen occupied gannetries, actually situated on twenty rocks or islets.

**TABLE OF GANNETRIES IN 1913, AFTER GURNEY.**

<table>
<thead>
<tr>
<th>Colony</th>
<th>Population (Total Birds)</th>
<th>Year of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WALES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grassholm</td>
<td>400</td>
<td>1903</td>
</tr>
<tr>
<td><strong>IRELAND:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bull Rock</td>
<td>500</td>
<td>(1908)</td>
</tr>
<tr>
<td>Little Skellig</td>
<td>16,000</td>
<td>1906</td>
</tr>
</tbody>
</table>
Colony. | Population (Total Birds) | Year of Estimate.
--- | --- | ---
Scotland: | | |
Ailsa Craig | 6,500 | 1905
St. Kilda | 30,000 | 1902
Sulisgeir | 8,000 | 1887
Sule-skerry Stack | 8,000 | (c.1904)
Bass Rock | 6,500 | 1905
Faeroes: | | |
Myggenaes | 1,500 | (1904)
Iceland: | | |
Vestmann Islands | 4,000 | 1898
Eldey, Geirfugladrangr | 9,500 | —
Grimsey | 100 | 1903
Canada: | | |
Bonaventure | 7,000 | 1898
Bird Rocks (Combined) | 3,000 | 1904

NEW COLONIES.

We now know of nineteen colonies as opposed to the fourteen described by Gurney. None of those in the table has been forsaken during the intervening period, although the Bird Rocks have suffered severe reduction, and the little Grimsey colony, placed under the Arctic Circle, hangs still by the slenderest thread. Of the additional ones now known four are most likely new since 1913; namely, two in Shetland (Hermaness, Unst, and Noss, Bressay), one in the Irish Free State (Great Saltee, co. Wexford), and one on the island of Anticosti in the Gulf of St. Lawrence. The date of establishment of the last is not definitely known, and it may perhaps have existed 25 years ago.

The fifth "new" colony is at Cape St. Mary, Newfoundland. It is the second largest of the four in North America and has been in existence more than fifty years, although unknown to the world till 1918, a record of it published in 1890 having been overlooked.

It is, of course, impossible to be sure that all the existing ganneries have been found, but it is more likely now than it was twenty years ago. Few suitable coasts have been unexplored during this time, and the remaining probability that there might be one somewhere on the little-known outer islands of Newfoundland and southern Labrador, where Funk Island may formerly have been tenanted by Gannets, has lately been shown to be unfounded.

We have not thought it necessary to take up the history of each colony where Gurney left it, a task which would involve nothing but the repetition of what has already been published elsewhere. We have given instead a list of the relevant
literature. The purposes of this paper are to give a review of our present knowledge of the population of Gannets, and to guide future census-takers through some of the difficulties which beset their work.

INTERPRETATION OF FIELD-OBSERVATIONS.

The greatest difficulty in a compilation of this kind is the interpretation of observations, made by different persons, on a uniform plan. Some writers have given the population of the colonies they visited in terms of birds, others in terms of nests, and still others in terms of pairs. None of these three means the same thing. For a colony comprising more than a handful of birds, the only really accurate figure obtainable is the actual number of nests, which bears a precise relation to the breeding population. It is, however, seldom possible to count nests on places frequented by Gannets, either because one cannot get ashore or climb the rocks, or else because the place is so remote and inaccessible that one must hurry to make the most of a fleeting chance.

Under these circumstances what is usually done is to estimate the number of birds present at the time, and then, by making various and not always justifiable allowances for absent birds, pairs at a nest, and non-breeding birds, to derive a figure for the entire population.

It is clear that the reliability of a summary like the present one depends entirely on our interpretation of the material available. Much has been learnt of late about the habits of Gannets during the breeding season, and we have tried to make use of our combined personal experiences in deducing a figure independently for the population of each colony, from the actual field-observations of the various naturalists who have visited them.

Our estimates are in many cases widely at variance with those originally given by other writers. Allowances have sometimes been made by others, for example, for both members of a pair being away from the nest; but we have found that during incubation and the early stages of fledging that the egg or chick is never left unguarded except upon the greatest provocation. Indeed it is sometimes possible, though inadvisable, actually to touch an adult on watch at the nest before it will take flight. Although on the approach of a boat or of a person in the colony itself the air may be filled with birds which have apparently left their nests to join in the general clamour, closer inspection shows that hardly any or no nests have actually been forsaken, and that these birds which fill
the air were not on active duty at all. Later on, as the chick grows bigger, it may sometimes be left alone; Lockley and Salmon (1934, p. 183) have estimated that less than one in fifty (2 per cent.) of the chicks are temporarily deserted by both parents at any one time during the later stages, up to the time when the dark juvenile plumage appears.

The presence of "extra" or unoccupied birds in a colony demands special attention. It is the rule that one member of a pair only is on duty at any time; but from time to time, at widely separated intervals during the day, the guard is changed, and, during incubation at least, this rite is attended by ceremonies which last some minutes. Often at this stage the relieving bird brings a piece of sea-weed, perhaps symbolic of the nest, and the two pass it to and fro, nodding their heads and bowing and crossing their bills. In a large colony there is always a certain number of relief ceremonies going on, and at these of course both members of the pair are at the nest. Lockley and Salmon (l.c.) estimate that approximately 5 per cent. of the nests at any time are attended by both birds.

In addition to these, there are in most colonies a larger or smaller number of entirely unoccupied birds, usually standing in a place apart by themselves, and almost all in adult plumage. In the past these have been regarded as barren or non-breeding birds spending the summer in the colony (cf. Gurney, 1913, p. 342); but this belief has no factual basis and now appears to be mistaken.

When ringing Gannets at Grassholm in July, 1934, Lockley found approximately 20 per cent. of the nests in the colony had no eggs or young, and in some cases no lining, but all nests were occupied by adults, and 5 per cent. by pairs of fully adult birds. It is probable that some of these empty nests had once held eggs or young which had been lost subsequently through natural causes, but it is also not improbable that some of the empty nests were occupied by non-breeding adults.

(Empty but occupied nests in any colony cannot easily be distinguished, at a distance, from full nests, and, therefore, all nests that are occupied by adults, whether with eggs or young, or without, are counted as valid for the purpose of this census).

Some non-breeding Gannets, both in adult and immature plumage, pass the entire summer at sea (e.g. Wynne-Edwards, 1935, p. 589). A very few immature birds, however, are to be seen in summer at the breeding places. Such dark and
speckled-feathered birds are said occasionally to make nests, sitting for a time as though incubating, although no egg is laid (according to Wmt. Duval, guardian at Bonaventure Island). The inference is that even in some adolescent birds breeding instincts are to some extent developed; and probably they are more or less aroused in all birds visiting the breeding places, in contrast to those which have no sexual inclinations and remain at sea throughout the summer.

In the second place, there is a pronounced difference between different gannetries in the ratio of these unoccupied birds present. Grassholm (Salmon and Lockley, 1933, p. 144) and Cape St. Mary (Wynne-Edwards, 1935, p. 589) may be cited as outstanding for the quantity of them to be seen. Grimsey (Roberts, 1934b, p. 101) has more for its size than any other. In contrast, comparatively few are present at the Bass (Gurney, 1913, p. 342) or at Bonaventure Island. Wynne-Edwards (l.c.) had doubts that all the unoccupied birds at Cape St. Mary were barren, and suggested that most of them were mates of birds on duty at the nest.

Dr. Harrison F. Lewis (Ottawa) has suggested to us an explanation for this disparity in the numbers of unoccupied birds seen at different colonies. According to his long experience, the chief feeding place of Gannets from Bonaventure is in Mingan Passage and the waters round the West Point of Anticosti, between sixty and a hundred miles from home. Other nearer feeding grounds, for example along the shore of Baie des Chaleurs to the south-west, are less frequented. It must take the birds two or three hours to reach these distant waters and as long to return; nevertheless they have enough time to feed and make such a long journey profitable, otherwise they would not go there in such large numbers. It might be expected, therefore, that under more normal circumstances, for example at Cape St. Mary, where the Gannets are to be seen fishing in considerable numbers between 10 and 20 miles from home (although a few wander at least as far as 80 miles to the west and 40 to the east), they would have a great deal more time to spare. If so, they do not spend it sitting on the water out to sea, for one seldom observes Gannets resting there for longer than a few moments. In brief, it is not unreasonable to suggest that the relative number of unoccupied birds is an index of the proximity of their feeding grounds. The latter vary considerably, of course, with the presence of shoaling fish in the neighbourhood. It is not definitely known how far Gannets will travel on a daily fishing expedition; but it is interesting
to note that a breeding adult ringed at Grassholm on July 17th, 1934, was recovered on May 22nd, 1935, in the following breeding season, 150 miles south-west of the island (Lockley, 1935, p. 75). On the other hand, both at Grassholm (by J. S. Huxley and Lockley) and Bonaventure (on one occasion by Dr. John B. May), Gannets have been seen diving within fifty yards of the islands.

Non-breeding birds are probably present among adults resting off-duty near the colony, and no doubt they form a small but, perhaps, fairly constant proportion at all gannetries.

An incident relative to this has lately come to hand. When Roberts, Bertram and Lack visited Grimsey in July, 1933, they counted 21 adults on 21 nests and, besides, 28 "non-breeding" or off-duty birds, only one of which was immature (Roberts, 1934b, p. 101). It thus appears that the number of non-breeders in 1933 was at least seven. This is the only instance known to us where the number of unoccupied birds has exceeded the number of nests.

It is interesting to note that in the following year (1934) there was an earthquake there on June 2nd, in which "vast numbers of birds' eggs were destroyed. The Gannet colony in particular suffered". When Holmes and Keith, to whom this latest information is due, visited the island on July 6th, only a single nest was left, others having apparently been destroyed. The maximum number of adults seen (now almost all free from the duties of incubation and thus unoccupied) was 43. One was found dead, a few may have been out fishing, bringing up the total to somewhat more than 44 birds.

THE GENERAL CENSUS.

It appears to us impossible, after considerable discussion, to give a reliable estimate of the total non-breeding population. At the colonies themselves immature birds usually amount to about one per cent. of the adults, and from this it may be inferred that the majority of adolescent birds remain at sea until maturity. The fact that even adult birds may also be seen hundreds of miles from gannetries during the breeding season (e.g. at Jan Mayen, off south-west Greenland, Straits of Belle Isle, etc.) suggests that the adolescents are not the only non-breeding wanderers to be reckoned with. We have, therefore, been content to provide figures for the breeding population only.* The wholesale ringing of young Gannets

* It may, however, be stated, for what little it is worth, that the various estimates advanced by one or other of us, but not agreed upon, have put the non-breeders at not less than 20 and not more than 70 per cent. of the number of breeding birds.
on Grassholm in July, 1934, by C. Wontner-Smith and R. M. Lockley, may in time yield mortality figures upon which a reliable estimate of the proportion of adolescent to adult birds may be based. Counts made on that occasion have shown already that not more than 60 per cent. of the potential hatch of young at Grassholm could that year reach the sea.

In the list of gannetries which follows the name of the colony is followed by its latitude and longitude; the estimate of the breeding population is given next in terms of \emph{pairs with nests}; and the year of the latest census or estimate is given at the end of the line.

\begin{center}
\textit{Pairs with nests.}
\end{center}

\begin{center}
\textbf{WALES.}
\end{center}

1. Grassholm. \hspace{0.5cm} $51^\circ 44' \text{N.}, \; 5^\circ 30' \text{W.}$ \hspace{0.5cm} 4,750 \hspace{0.5cm} 1933

Photographic censuses made independently by two observers. Salmon and Lockley, 1933, p. 142.

\begin{center}
\textbf{IRELAND.}
\end{center}

2. Great Saltee Island. \hspace{0.5cm} $52^\circ 06' \text{N.}, \; 6^\circ 38' \text{W.}$ \hspace{0.5cm} 1 \hspace{0.5cm} 1935

Pollard, 1934a and 1934b; Kennedy, 1934. Pollard informs us that there was only one nest and one pair in 1935.

3. Bull Rock. \hspace{0.5cm} $51^\circ 35' \text{N.}, \; 10^\circ 19' \text{W.}$ \hspace{0.5cm} 400 \hspace{0.5cm} 1930

B. B. Roberts visited this colony in 1930 and estimated \textit{(in litt.)} the rock to be "nearly full" and a "very considerable increase" over Gurney's figure of 500 birds for 1908. We have therefore felt justified in putting the colony at 400 nests, but it is probably larger.

4. Little Skellig. \hspace{0.5cm} $51^\circ 46' \text{N.}, \; 10^\circ 30' \text{W.}$ \hspace{0.5cm} 10,000 \hspace{0.5cm} 1930

R. M. Barrington, 1914, p. 154, stated that there had been a marked increase over Gurney's figure of 16,000 birds. B. B. Roberts informs us \textit{(in litt.)} that he visited it in 1930 and found "almost every available ledge occupied". Probably full now almost to capacity, and put down at 10,000 pairs.

\begin{center}
\textbf{SCOTLAND.}
\end{center}

5. Bass Rock. \hspace{0.5cm} $56^\circ 05' \text{N.}, \; 2^\circ 40' \text{W.}$ \hspace{0.5cm} 4,147 \hspace{0.5cm} 1929


6. Ailsa Craig. \hspace{0.5cm} $55^\circ 15' \text{N.}, \; 5^\circ 08' \text{W.}$ \hspace{0.5cm} 7,000 \hspace{0.5cm} 1935

Paton and Pike, 1929, pp. 146-150, estimate 14,000 birds on Ailsa. Gurney's figure of 6,500 they consider much too small; it was deduced from a sample count on a photograph showing some 750-850 birds, said to comprise one-sixth of the total. Taking 750 as the number of birds seen in the photograph, we ourselves should reckon that there were about 725 visible nests, and thus about 4,300 \emph{pairs} in the colony; Gurney's deduction of 6,500 \emph{birds} is thus clearly too low even on his own datum. Paton and Pike state that for every bird seen in the photograph, three
more are hidden in crevices and behind pillars; which would imply that there were actually 13,000 nests even in Gurney's time (1905), and the population is said to have increased since then. How do they arrive at a total of 14,000 birds? If, as we understand, they base their estimate on Gurney's and allow for hidden birds being rather more numerous than those exposed to view, the figure should stand at some 10,000 pairs at least. Salmon spent two days on Ailsa Craig in July, 1935, with Lord Dumfries, but bad weather precluded the possibility of their taking an accurate census as had been planned. He formed the opinion, based on experience elsewhere, that there were approximately 7,500 pairs there. We have been conservative at 7,000 pairs, which is nearly 70 per cent. more than on the Bass. Gurney did not think Ailsa a much larger colony than the Bass (1913, p. 111), and actually the figures he gave for the two were the same (ibid., pp. 324-325).

7. Saint Kilda. 57° 52' N., 8° 30' W. 16,500 1931
Harrisson, 1933, and Harrisson and Lack, 1934, estimated a total of 21,300 birds seen on the three islands used by Gannets, viz. Stac Lee 10,000, Stac an Armin (or "Arnim") 7,000, and Boreray 4,300. If this is approximately correct, and the unoccupied birds were less than 20 per cent. of the total, the breeding population would not be less than 16,500 pairs. This is similar to Dr. Wiglesworth's 1902 figure used by Gurney, namely 15,000 nests, based on a sample count of 1,400 eggs taken from the top of Stac Lee, from which the total was computed with the help of local experience. We notice that whereas the population of Boreray appears to have dropped 50 per cent. since 1902, those of the other islands are said to have greatly increased; which is significant since Stac Lee was considered packed to capacity 30 years ago.
This is, no doubt, by far the largest gannetry extant.

8. Sula Sgeir. 59° 06' N., 6° 10' W. 5,000 1933
Harrisson, 1933, gives "a rough long-distance estimate of 9,000 birds" in August, 1931; Stewart, 1934, p. 44, however, considers that Harrisson's estimate should not be relied upon. He mentions 6,500, without putting the figure forward as an estimate, adding that Gurney's figure (8,000) is well in excess of the present Gannet population. 6,500 birds would probably represent a breeding population of between five and six thousand pairs, depending on the number of unoccupied birds present. Stewart also states (ibid.) that in 1933, 2,000 young Gannets were killed for food here by men from Lewis. Since Wontner-Smith and Lockley found it possible to catch and ring nestlings from only 40 per cent. of the total number of nests on Grassholm, it is likely that it would be possible to kill only young Gannets from 40 per cent. of the nests on Sula Sgeir. The nestlings at a suitable age for ringing would only be a little younger than those of an age suitable for killing. Furthermore, the ground at Grassholm is only slightly more accessible for the purpose of catching Gannets than at Sula Sgeir, conditions at both being similar. It would be reasonable, therefore, to consider 2,000 birds as representing 40 per cent. of the occupied nests, making a total of 5,000 occupied nests on Sula Sgeir.
9. Sule Stack. 59° 02' N., 4° 30' W. 4,000 1914

Pairs with nests.

Gurney, 1914, p. 633, gives an estimate made by the Duchess of Bedford in 1914 of "5,000". The Duchess herself says, 1914, p. 176: "I counted the birds before many of them rose on a portion of the rock which was most thickly occupied, and my opinion is that there were about 5,000 at the time of my visit. If anything, this may be a little under the mark, but I should certainly say there were less than 6,000". Those birds which rose into the air were, of course, off duty, and may have numbered as many as 1,000, a figure based partly upon what may be seen in the photographs. The breeding population should therefore be put down, conservatively, at 4,000 pairs.

SHETLAND ISLES.

10. Noss. 60° 09' N., 1° 02' W. 800 1935

Macpherson, 1933 (1 pair in 1914); Tulloch, 1915 (4); Greatorex, 1919 (5); Meade-Waldo, 1920 (10 pairs). Increasing rapidly; L. S. V. Venables visited Noss in 1934 and made a rough estimate of approximately 800 pairs. In the same year the watcher, J. W. Jamieson, however, put them down at 300 nests. A. Holte Macpherson, who visited the colony, 1931 to 1933, and found the nests difficult to count owing to their situation on the 600-foot cliff, considers this figure too low. We have, therefore, put it down at 800 nests, as an increase is again reported in 1935. Now breeding both on the Noup and the mainland of Noss.

11. Hermaness, Unst. 60° 51' N., 0° 54' W. 1,000 1935

Meade-Waldo, 1920, estimated about 100 pairs on the Rumbling, and fewer on Humla Stack. Actually it appears there are no Gannets on the Rumbling, but on the stack (Vesta Skerry) close to it. A. Holte Macpherson, who last visited Unst in 1933, found five colonies near each other. The watcher, Lawrence Bruce, gives the following figures for these five sites, 1934: 200 nests at Vesta Skerry; 200 at Humla Houla (not Humla Stack) and Burra Stack; 200 at Neepna Stack and (since 1932) on the cliff of Neepna opposite. These figures Macpherson considers too low. Griffith, 1929, calculated over 1,000 pairs in this group in 1928. The watcher reports a further increase in 1935, and we feel justified in putting the total for 1935 at 1,000 nests, roughly divided 200 to each colony. There are no Gannets on Muckle Flugga as stated by Ritchie, 1929, p. 131.

FAEROES.

12. Myggenaes Holm. 62° 08' N., 7° 41' W. 750 1928

and 1935

Apparantly no change since Gurney, 1913. More recent photographs, but no estimate, appeared in Hagerup, 1926. Miss C. M. Acland (in litt.) visited and photographed the colony in 1928, estimating it at 750 pairs. R. M. Lockley passed close to the colony in June, 1935, and estimated that not more than 1,000 birds were present.

The two stacks west of the Holm are used by Gannets, possibly mainly as standing grounds for unoccupied birds, but Miss Acland's photographs show apparently nesting birds also.
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Pairs with nests.

ICELAND.

13. Westmann Islands. 63° 23' N., 20° 20' W. 4,000 1935
Four islands tenanted. The estimates of Roberts, 1934a, pp. 245-248, and 1934b, p. 103, here and at Eldey, have been corrected by Lockley and Salmon, 1934, p. 183. Lockley visited two of these colonies in June, 1935, and found 317 nests at Brandur and estimated 2,600 nests at Hellisey. Allowing 5 per cent off Roberts' figures of 1,020 birds at Sulnasker and 200 at Geldunger, we get a total for the four colonies of 4,000 nests.

14. Eldey. 63° 44' N., 22° 57' W. 8,000 1934
Roberts', 1934b, p. 103, estimate is based on area alone. His brother, who made it, calculated that there were 14,000 birds on the island, which would, of course, imply something of that order of nests. But by comparison with Grassholm the three acres of Eldey seem unlikely to support more than seven to eight thousand nests, however closely packed.

15. Grimsey. 66° 32' N., 18° 00' W. 21 1933

PROVINCE OF QUEBEC.

16. Anticosti 49° 11' N., 61° 45' W. 500 1928
(Gull-cliff Bay).
Taverner, 1929, p. 78. Estimate of number of nests.

17. Bonaventure Island. 48° 29' N., 64° 09' W. 6,500 1934
Reliable estimate based on annual computations of number of nests for several years past, by H. F. Lewis. The gannetry is well described by Taverner, 1918.

18. Bird Rocks. 47° 51' N., 61° 08' W. 500 1932

NEWFOUNDLAND.

19. Cape St. Mary. 46° 49' N., 54° 11' W. 4,500 1934
Wynne-Edwards, 1935, p. 588. Estimate of number of incubating birds by observation and from photographs, with allowance for unoccupied birds, of which a separate estimate was made.

Summary.

The sum of the breeding birds at the nineteen colonies or groups of colonies now known is approximately 78,000 pairs (156,000 birds), with a probable error of the order of ±10,000 pairs, distributed as follows:

British Isles ... ... about 53,500 pairs.
Faeroes and Iceland ... ... about 12,500 pairs.
Canada and Newfoundland ... about 12,000 pairs.
There has thus been a great apparent increase in the population during the last twenty to thirty years. Gurney's total of 101,000 birds included all except the season's hatch, but we should add to it between five and seven thousand birds on account of the unknown American stations. (No allowance was made by him for non-breeding birds absent from the colonies in summer; thus for comparison we are not obliged to estimate these either). Our estimate, therefore, exceeds Gurney's by at least 48,000 birds, even discounting non-breeders present at the gannetries.

Although the earlier censuses available in 1913 were even less accurate than those we have used, there seems little doubt that a real increase has occurred. Gurney's figures we know to have been wide of the mark in a number of cases, especially those based on his personal visits to gannetries; these without exception were too low, sometimes (e.g. Ailsa Craig) by as much as 30 or even 50 per cent. Against this, however, are widespread reports of increase, especially marked at Grassholm, Bonaventure Island, and Cape St. Mary; and the establishment of three, if not four, new colonies, albeit small and in one case, perhaps, only temporary (Great Saltee), points also towards progress in numbers. There have also been abortive attempts by isolated pairs to breed at three other sites at least in the British Isles. In 1922 a pair built a nest at Lundy Island, where the oldest known colony in the world became extinct in 1907 (Loyd, 1922, p. 154). In the same year a pair built on the Isle of May, in the Firth of Forth (Baxter and Rintoul, 1923, p. 73), and from 1924 to 1928 a pair built on Bempton Cliffs, Yorkshire (Naturalist, 1925, p. 26, and 1929, p. 81). Another pair is reported to us to have attempted to nest in south-east Scotland. The only colony known to have dwindled seriously is Bird Rocks (Grimsey being too small to carry much weight in the total).

This increase is almost certainly due in part to concerted efforts on both sides of the Atlantic to protect Gannets, and to the fact that fishermen, except at the Iceland and Sule Sgeir colonies, no longer use eggs and young Gannets for food and bait. Modern transport facilities have opened up other sources to them which involve neither breaking the law nor the risks and effort which attended their former depredations. In part it may be due also to a natural rise of a periodic kind, which will fail before long to maintain its present pace.

More definite comparisons between this and Gurney's census we do not believe are justified. This census should
be regarded rather as a second approximation to the number of breeding Gannets, to which Gurney's was the first.

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GREATOREX, C.

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HAGERUP, O.

HARRISON, T. H.

HARRISON, T. H., AND DAVID LACK.

HOLMES, P. F., AND D. B. KEITH.

KENNEDY, P. G.

LOCKLEY, R. M., AND H. MORREY SALMON.

LOCKLEY, R. M.
(Note.—Gannet 113,036, stated in error "ringed as nestling", was ringed as adult.)

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