

## Research, Conservation and Education, 1970

The aims of the Wildfowl Trust, and its activities during 1970, may be considered under these three headings, though they do not represent sharp divisions.

### Research

Here the aim is to increase the knowledge of wildfowl from any point of view, with emphasis on 'practical' research that will give meaning and direction to conservation measures and management.

Over the past 23 years the populations and distribution of ducks wintering in Britain have been monitored by monthly sample counts carried out by several hundred amateur ornithologists. The most recent data are given on p. 134. In the last five winters international counts, covering much of Eurasia, have also been organised from Slimbridge by Mr. Atkinson-Willes as Co-ordinator of the Duck Working Group of the International Wildfowl Research Bureau (I.W.R.B.). Geese require more intensive counts but these can be less frequent as, in many cases, they amount to near complete population censuses (p. 134). Mr. Ogilvie also collects the international data on the Brent Goose for the I.W.R.B.

Britain is much less important as a breeding area for wildfowl, but nevertheless it was desirable to obtain some quantitative idea of the distribution of the breeding ducks. The data, collected over five years, has now been analysed (p. 63). Useful exchanges of data were made with the British Trust for Ornithology, currently engaged in a presence-or-absence survey of breeding birds. The intensive study of duck breeding biology at Loch Leven, lasting five years, was completed (p. 138). Here ringing of the nesting birds played an important rôle as it did in the joint study, with the Edward Grey Institute, Oxford University, on the colonially breeding Mute Swans at Abbotsbury and Weymouth, Dorset, and with Dr. C. D. T. Minton's Trust-aided study (p. 71). The ringing programme is, however, mainly directed at non-breeding ducks, to monitor changes in migration and mortality patterns. The numbers marked in 1970 are summarised at p. 135, followed by accounts of activities at Borough Fen Decoy and Abberton Reservoir. At Slimbridge the regular small autumn catch was made to maintain a long-term sequence. At Nacton Tom Baker wound up a unique career of 52

years as the decoyman, converted from killing to ringing for the Trust in the last four. He will be succeeded by his son-in-law, Don Revett, in 1971. The 1969-70 season was the last in which Dersingham Decoy, Norfolk, was operated as a ringing station for the Trust. Analysis had shown that its results were not usefully different from our other decoys in East Anglia, and rational economies had been called for by the grant-aiding body. We are most grateful to the owner, Mr. J. E. A. Lambert, and the decoyman, Mr. R. Berry, for their contribution to our studies. Over 4,500 duck had been ringed there since the decoy was rebuilt in 1963.

The future of the long-term monitoring programmes of counting and ringing was assured under a Contract successfully negotiated with the Natural Environment Research Council (N.E.R.C.), coming into effect in April 1971. Under it, arrangements are made for the use of Automatic Data Processing facilities at the Biological Records Centre of the Nature Conservancy at Monks Wood, Huntingdon. Preparations were made for the change over to punched tape and card storage and automatic analysis. The rapid availability of completed analyses will greatly enhance the value of the massive data accumulated. Meanwhile an analysis of part of the ringing data from Borough Fen Decoy is given at p. 89.

Another N.E.R.C.-sponsored research programme, on the feeding ecology and behaviour of geese, drew to a close with the 1970-71 winter. Dr. Owen's three-year study of the White-fronted Geese feeding at Slimbridge is now complete and is being published. It is hoped that further work will be carried out at Caerlaverock, Dumfriesshire, where Mr. Campbell made a basic first year's study (p. 150) of the Barnacle and Pink-footed Geese. He had earlier rounded off a four-year study similarly concerned with the relation between geese and agriculture at Loch Leven. The behavioural aspects of feeding were further studied by Dr. Kear using the unrivalled facilities for rearing wildfowl in the Collection at Slimbridge. She also made growth studies and detailed

analyses of breeding success. Data gathered during her stay in New Zealand were further brought to publication.

The health of the Collections was monitored by routine post-mortem examinations. Dr. J. V. Beer, after 16 years at the Trust, left to direct a research unit at Newcastle University. He was succeeded by Mr. N. A. Wood, from the Game Research Association. We were also fortunate to obtain the services, as honorary Veterinary Adviser, of Mr. P. N. Humphreys, M.R.C.V.S. Some useful

advances in the treatment of sick birds were made. A small isolation unit was constructed, also a surgery, equipped with an X-ray machine. The control of avian tuberculosis was advanced by the co-operation of Dr. A. McDiarmid of the Agricultural Research Council, Compton. Further additions were made to the museum reference collections and material was supplied to many workers in other institutes.

G.V.T.M.

## WILDFOWL CENSUSES AND COUNTS IN BRITAIN, 1970-71

### Goose censuses

**Pink-footed Goose** *Anser brachyrhynchus*. The annual census was held on 7th/8th November, when there were 72,000 Pinkfeet in the country. This total was slightly, but not significantly, fewer than the previous year. Breeding success was about average with 23.1% young birds in the flocks and a mean brood size of 2.2.

**European White-fronted Goose** *Anser albifrons*. An early peak of 11,000 was reached in mid-January after which the mild weather led to a drop in numbers. The breeding season was one of the best ever (45.0% young; brood size 3.5).

**Greenland White-fronted Goose** *Anser albifrons flavirostris*. No complete count of this race was attempted but at its main haunts numbers were about normal. Breeding success was monitored in western Scotland and in Ireland. In both areas there were only about 14% young present.

**Greylag Goose** *Anser anser*. The census on 7th/8th November showed there to be about 65,000 Greylags in the country, an increase of 3,000 on the previous year. The proportion of young birds (25.1%) was the highest for several years. The mean brood size was 2.4.

**Barnacle Goose** *Branta leucopsis*. The Spitsbergen population wintering on the Solway had one of their best breeding seasons ever (47.2% young; mean brood size 3.0). However, the maximum count was only 3,200, presumably because the mild winter allowed many birds to stay in Norway.

The Greenland population had an average breeding year (19.4% young;

mean brood size 2.5). No census was carried out but the principal wintering haunt of Islay held about 15,000 birds throughout the winter.

**Light-bellied Brent Goose** *Branta bernicla hrota*. The flock at Lindisfarne, Northumberland, reached a low peak of 650 in early February. Over 12,000 were counted in Ireland in November.

**Dark-bellied Brent Goose** *Branta bernicla bernicla*. 1970 was the second successive good breeding season with 40% young birds in the flocks. Consequent upon this was a record count of 23,500 in Britain in November.

M.A.O.

### Duck counts

**Mallard** *Anas platyrhynchos*. This was a record season for Mallard, the seasonal index being the highest since counts started. Exceptional numbers were present in England and Wales for most of the winter.

**Teal** *Anas crecca*. The increase since the cold winter of 1962-63 continued, with the larger flocks being seen in the south-east of England.

**Wigeon** *Anas penelope*. Another good season. The Ouse Washes again carried large numbers—32,000 in January. Some of these may have been attracted from the Wash, which has never been included in the priority count sample, so the apparent increase of the past two seasons may not be so great as the indices suggest.

**Pochard** *Aythya ferina*. A poor season. They were especially scarce in Scotland and south-west England and Wales.

**Tufted Duck** *Aythya fuligula*. A record season, with the highest seasonal index since counts started.

**Shelduck** *Tadorna tadorna*. A good season. The main influx occurred in December.

**Season indices 1970-71** (1969-70 = 100)

Mallard	118	Pochard	136
Teal	68	Tufted Duck	126
Wigeon	130	Shelduck	103

### International Wildfowl Census 1970-71

The fifth census in Britain was held in the same manner as last season's census, with counts in mid-November and in mid-January. Considerably more sites were covered this season than in 1969-70 as shown in the table below.

Census November counts January counts

1969-70	887	1060
1970-71	1013	1124

G. L. Atkinson-Willes  
Barbara Yarker

### DUCKS RINGED BY THE WILDFOWL TRUST, 1970

	Abberton	Nacton	Borough Fen	Deeping Lake	Dersingham	Slimbridge	Loch Leven	Others	
Shelduck	12							1	13
Pintail	9	292	1						302
Teal	1049	140	228		8	13		3	1441
Mallard	1274	625	1160	268	37	430	44		3838
Gadwall	5	2		3		5	9		24
Wigeon	59	173	1		23	1	4	1	262
Garganey	8								8
Shoveler	23	3	3	6				2	37
Red-crested									
Pochard	1								1
Pochard	10			4					14
Tufted Duck	133			55			349		537
Scaup							1		1
Red-breasted									
Merganser							5		5
Totals	2583	1235	1393	336	68	449	412	7	6483

M.A.O.

### ABBERTON RESERVOIR, 1970

Low temperatures and snow caused the Top and Middle Sections of the Reservoir to be iced over for the first part of January, thus effectively putting most of the duck traps out of action. After the thaw there were over 6,000 ducks distributed throughout the Reservoir. Nearly a thousand were Wigeon and when some started feeding along the shores of the Middle Section they became of immediate trapping interest. However, as so often

happens with this species, they showed a far greater interest in the available natural vegetation, and at first completely ignored the heavily baited traps. With the rapidly rising water reducing the shoreline quickly, the birds moved on to adjoining wet pastures. It was not until the 24th that two were caught. Sporadic catching went on until 9th March, but no good lead was obtained at any time and only 48 were ringed.

Repeated snow cover occurred throughout the rest of the winter, with some severe blizzards, and March was a particularly bleak month. Two large portable wader and passerine traps were constructed to further Mr. Fred Trust's future ringing programme.

The maintenance programme was hindered by April being almost as cold as March, but some progress was made and work completed on several traps. It was not until September that maintenance work could be said to be finished. The boats in particular needed considerable attention in all aspects, painting, structural and mechanical.

The breeding season was a delayed one, and produced only half the normal number of Mallard broods, whereas the diving ducks did rather better. Shelducks were almost a complete failure.

The change in weather conditions from the beginning of May was dramatic. One of the driest and sunniest periods experienced for many years continued almost unbroken until October. By the end of June the daily water demand was 20 million gallons with a further four million gallons lost through evaporation. The level dropped quickly and attracted duck; on 5th August, 4,500. Some 1,250 were feeding over the newly emerged Island, and three traps were subsequently moved out there.

For the following three months traps were operated almost continuously on the Island and Top Section. The depth of mud exposed on the Middle Section shore prevented the use of traps but not before they had made a useful contribution to wader ringing, including ten Curlew Sandpiper out of a flock of 30 at the end of August.

Last year's Shoveler catch could not be repeated in spite of a build-up of 500 on the Reservoir in late summer. In the hope of catching some of the Pochard summer moulting flock, an old small bird trap situated on the Dam had been converted into a duck trap. But the Pochard flock never reached 2,000, compared with over 5,000 the previous year, and due to prevailing adverse winds and other factors they failed to feed in the Dam area. Not one was taken.

From 14th June until 25th September 189 flightless moulting ducks were trapped and ringed, all Mallard apart from a Teal and a Pintail. These were mostly taken on the Top Section where reeds provide the necessary cover.

The highest complete Duck Count of the year, in October, was 7,592 comprising

nine different species, mostly on the Main Section. The harvest had been quick and clean and there was little spill left on the fields for ducks as in previous years. In consequence numbers on the smaller Western Section, by the main grain growing area, were unusually small, affecting the catching, particularly of Teal. However, the Island traps compensated for this loss; of 899 ducks ringed from them the majority was Teal.

October and November produced some exceptionally windy days, and this part of the season's work provided many uncomfortable journeys through the turbulent waters round the Island. There were not too many regrets when an unusually wet November quickly refilled the Reservoir and the Island had to be abandoned in early December. There was no severe weather until the Christmas period brought heavy snowfalls. The total number of ducks ringed was 2,583, distributed as shown in the Table.

#### Monthly catches of duck at Abberton in 1970

January	183	July	217
February	111	August	315
March	32	September	665
April	18	October	454
May	56	November	235
June	99	December	198

Fred Trust and Tony Langstaff continued the passerine ringing and study programme. Between them they were able to man the station on 115 days and were richly rewarded by a total of 3,128 passerines of 51 species which included 986 warblers. Careful selection of the mist netting and trapping sites has enabled a representative selection of passerines to be ringed without disturbing the wildfowl. A small but interesting variety of waders was taken in August.

On 1st May the seven acre Abberton Public Bird Watching Site with its large Hide and other amenities was opened by Mr. A. W. White, Chairman of the Essex Water Company. The Hide gives the public a vista of the Main Section of the Reservoir and the opportunity to view the birds unobserved and in comparative comfort. It was at its most spectacular during the low water of September and October when extensive mud flats spread out in front of the Hide attracted large numbers of waders and duck. A small collection of pinioned duck were introduced on to the pond and these attracted numbers of wild birds.

*R. King*

## BOROUGH FEN DECOY, 1970

Early January was cold, with the Decoy pond and Deeping Lake frozen from the 2nd to the 10th. Snow which settled on the pipes was shaken off daily to avoid tears in the net. Most of the duck left for open waters and the Fenland fields. The best day count was 38 Mallard, 160 Teal and four Shoveler.

A freeze-up between the 10th and 18th February again scattered the roosting birds and despite early morning ice breaking and heavy feeding, only one Teal was trapped during this period. Mallard appeared to be spending much of the day roosting on open fields, especially on wheat following potatoes where it is unnecessary to work the land and they are undisturbed.

A freak snowstorm on 4th March broke down a lot of elder and blackthorn outcrops that are so valuable for cover. Although the nets on the big ends of the pipes sagged alarmingly, none were torn nor did any hoops bend or break. The final Mallard duck of the season was taken in the SE. pipe on the 25th.

Some hundred bundles of reed were cut from our reed bed and at Dersingham (with the kind permission of Mr. J. E. A. Lambert during early April and preparations were made to clear the encroaching *Phragmites* that threatens to spread over the whole two and a half acre pond. In all ten yards was dug off the northern edge of the reed bed and six feet from the sides. The three big White Poplars that threatened the big end of the NE. pipe were felled. (A fourth had in fact fallen and demolished the pipe in 1969.)

General maintenance and mowing continued into May when a display was prepared for the European Conservation Year exhibition at Peterborough Museum. Preparations were made for the open weekend on 7th and 8th June when 101 visitors were shown trapping and ringing techniques and encouraged to enjoy the peaceful tranquillity of the paths and glades.

After an interval of two years, disused nests were again taken for Dr. M. J. Worms to check for parasites and larvae. Nests of ducks and waders were also taken from the reserve at Welney.

On 15th June two young Mallard not yet flying were taken in the SE. pipe and started the 1970-71 season. A diaphragm type pump was hired to remove some of the glutinous mud accumulating on the north of the pond. The deposit is at its

worst on that side as the prevailing S. and SW. winds blow the fallen leaves to the margins before they become saturated, sink and decompose.

Helped by the Spalding and District Wildfowlers' Association, the flock of Canada Geese at Grimsthorpe Park were caught up and 148 plus one Greylag were ringed. The 470 caught included 62 ringed in previous years and only 31 juvenile birds. Later in the month the Whittlesey Wildfowlers released 51 hand-reared Mallard on the Decoy pond.

Problems arose in the first weeks of August in obtaining water from the river Welland to top up the decoy pond. The method used since Cornelious Vermuyden, in the 17th century, built the banks to contain the river, has been to open the sluices between the river and the washland banks and let the water flow down into the decoy pond. Unfortunately, a fall of masonry partially blocked the culvert. Some water invariably soaks into the peaty banks and there were further losses due to leaking slackers at junctions. The final trickle of water was collected in the filler drain and then pumped into the pond. This just maintained a very low level and continued pumping was needed until late October. No doubt this was partly responsible for the lower numbers of duck using the decoy as a roost.

292 completed Nest Record Cards were forwarded to the British Trust for Ornithology, including 12 Great Crested Grebes' on Deeping Lake.

Gale force winds littered the paths with debris on the 9th/10th September and many of the duck left, disturbed by creaking trees and snapping twigs. The year's best midday count was 1,050 Mallard, 80 Teal, 20 Shoveler, three Wigeon and two Pintail, making a total of 1,155 duck.

The first Fieldfare chuckled over the wood on 14th October. Some disturbance was caused by potato pickers but the low water level was probably the main reason for the small catches.

The first frosts of November dislodged the leaves that had withstood the winds and the Poplars stood gaunt and black. The pond had now filled naturally with the autumn rains, but the lead did not reappear. The Mallard still preferred the open fields. In all 1,393 duck were caught in the Decoy in 1970 supplemented by 339 from Deeping Lake.

W. A. Cook

## LOCH LEVEN, 1970

The Trust's activities at Loch Leven, begun in 1966, drew to a close this year.

A fourth winter of studying the Greylag and Pink-footed Goose flocks feeding over the fields surrounding the Loch was completed in April. The type of field, the flock position and density, the feeding direction and rate, and the proportion feeding were all noted. A major difference to last year's long slow spring was a very mild spell in April when the cereal fields suddenly turned green. This was reflected in an increased amount of spring cereal grazing. The accumulated data for a varying set of winters will now be analysed and will form a useful basis for comparison and contrast at Caerlaverock.

To help with the duck nesting study, Mr. T. A. Gibson spent six months at Loch Leven, as a temporary assistant. Other help was available from the Nature Conservancy's Warden, Allan Allison, and, for short periods, from Slimbridge. Thus we were tided over a period of staff shortage, following the death last year of Ian Marshall, and the absence in Canada of Dr. Ian Newton of the Nature Conservancy, Scotland.

Monthly counts of the ducks using the Loch were made. St. Serf's Island, the main breeding site, was searched, on a weekly basis, for duck nests and 944 were found. Thus in the five years of the study we have accumulated data on more than four thousand duck nests, mainly Mallard and Tufted Duck. Their final analysis will provide a very real contribution to our knowledge of duck breeding biology.

Using hand-nets, 213 nesting females were captured for ringing. Of these, 64 proved to be recaptures from previous years, yielding valuable data on individual site preference and tenacity (since each nest with a marked female has its position precisely plotted). Some of the recaptures confirmed earlier suspicions that quite a sizeable proportion of Tufted Ducks are laying at the end of their first year of life, like Mallard, instead of having a non-breeding year between.

The eggs hatched in 292 Tufted Duck nests, compared with 164 in 1969. This was due to an increase in the proportion hatching successfully in 1970 since the numbers of nests found was actually seven less. This may well be owing to the intensive control measures applied to the Jackdaw population by the Conservancy. Jackdaws had been shown to be serious predators of duck nests in previous years.

To test this further, a comparison was made between the fate of duck nests in the areas of the island searched at weekly intervals and in a control area (100 × 100 m.) which was not entered until after the breeding season. The 99 nests found therein were examined and their species and fate determined from the nest feathers and the condition of the egg shell fragments. It was found that 80% of the Mallard and 86% of the Tufted nests had hatched, as opposed to 50% and 71% elsewhere on the island. However, although the searching disturbance did result in more meals for Jackdaws, the final production of fledged young is not affected because it is in any case very low on the wave-ridden shelterless Loch. This was again confirmed by our regular brood counts. Besides the control zone comb-out for nests, a series of transects across the island were also searched after the nesting season. These provide the basis for estimating the nesting population of St. Serf's by sampling in the coming years when the full nesting study will not be made. This will be especially important in 1971 when the International Biological Programme's research on the total ecology of the Loch is rounded off.

The researches of Mr. K. A. Loughlin into the energy requirements of nesting ducks, for a Ph.D. study at Stirling University, were supported by the provision, under licence, of adult and egg specimens. One Tufted Duck clutch was taken to Slimbridge for rearing, to round off Dr. Janet Kear's study of the development of the ducklings (*Wildfowl* 21, pp. 123-132). One unofficial attempt to remove 80 eggs from St. Serf's was made by a youth who crossed over the half mile of water on an air mattress. He escaped from the fisherman who apprehended him, on the arrival of his large and threatening father!

The writer finally left Loch Leven at the end of July to take up the post of Refuge Manager at the Trust's newly leased Eastpark Farm, Caerlaverock. Sadness at leaving a lovely place, where five wonderful years had been spent with the wildfowl, was thus tempered with anticipation for the future. Mr. Gibson stayed on until mid-September, operating the dive-in traps for the fledged Tufted Ducks. He produced a useful total, together with the unusual bonus of a family of Red-breasted Mergansers.

Colin Campbell

## Conservation

The Trust's contribution to conservation is threefold—the application of its research findings; the maintenance of its Refuges at Slimbridge, Welney and Caerlaverock; and the breeding of endangered species in its Collections at Slimbridge and Peakirk.

The application of the monitoring research results is made mainly through the Nature Conservancy in Britain. Its Wildfowl Conservation Committee was chaired in 1970 by Mr. Scott. Through this Committee, and less formally, close liaison was maintained with the Wildfowlers' Association of Great Britain and Ireland (W.A.G.B.I.) and the Royal Society for the Protection of Birds, both closely concerned with wildfowl conservation. Liaison is also maintained with the County Naturalists' Trust, especially of those counties in which our Refuges lie. In the international field, co-operation, essential because of the migratory nature of most wildfowl, is through the I.W.R.B. Professor Matthews serves as its Director, in an honorary capacity, and the headquarters is based at Slimbridge with Mr. E. Carp as Administrator.

An international Technical Meeting was organised at Espoo, near Helsinki, Finland, to thrash out an agreed text for a Convention on "Wetlands of International Importance, Especially as Waterfowl Habitat". This was successfully achieved and preparations then went forward for the next International Conference on the Conservation of Wetlands and Waterfowl, at Ramsar, Iran. Here the acceptance of the Convention was to be one of the main achievements (p. 122).

This was European Conservation Year (E.C.Y.) and two major threats to goose populations in Europe concerned Britain. If the Third London Airport were built at Foulness, a fifth of the population of the Dark-bellied Brent Goose would lose its feeding grounds. Every effort was therefore made to convince the Government-appointed Roskill Commission that the airport should not be sited there. The relief when the Commission rejected Foulness was short-lived, for their conclusions were rejected by the Government. Then, in Iceland plans were announced to flood the great þjórsárver oasis, breeding grounds of the Pink-footed Goose and scene of the major ringing expeditions of the Trust in 1951 and 1953. To lend credence to the objections which were put forward it was necessary to have an up-to-date assessment of the importance of the area (p. 5).

A major E.C.Y. contribution was the official opening of Welney Wildfowl Refuge with its fine new Observatory (Plate IX). Further purchases of land in the area were made (p. 155). The Trust also took the lease of Eastpark Farm, Caerlaverock, and will be developing it as another Wildfowl Refuge (pp. 150 and 155). The Trust's original Refuge at Slimbridge continued to attract large numbers of White-fronted Geese and Bewick's Swans (pp. 139 and 140).

As usual considerable efforts were made to breed up wildfowl, especially the endangered species, in the Collections at Slimbridge and Peakirk.

G.V.T.M.

### SLIMBRIDGE: THE WILD GEESE 1970-71

#### European White-fronted Goose *Anser albifrons albifrons*

Eleven arrived on 29th September and numbers built up slowly to 128 on 26th November. There were larger influxes in the first half of December to give totals of 500 on the 5th and 1,250 on the 18th. There were 1,700 present on the 23rd and 3,850 on the 29th, when there was a brief cold spell. During early January the total rose to over 5,000 and to a peak of 6,000 on the 18th. This number stayed for a few days before dropping to about 5,000 at the beginning of February. The total fluctuated between 4,400 and 4,800 through most of February until departures began on the 23rd. There were 2,950 counted on the next day, and only

1,600 on the 25th. These remained for over a week before the total fell to 1,320 on 9th March. On the 11th there were 400, and the last two were seen on the 12th.

It was an extremely good breeding season in 1970, one of the best recorded since the Trust started. Age counts in December revealed 47% young in the flocks, with an average brood size of 3.5. Later samples showed that there had been the usual slight drop, but on 5th February there were still 42% young and the brood size was the same as before.

Such a large proportion of young following on a good year in 1969 might have been expected to lead to record numbers of geese. However, the unusually mild

conditions after the New Year cold spell meant that the geese were able to stay in the Netherlands instead of getting pushed over to Britain.

**Lesser White-fronted Goose** *Anser erythropus*

We have received a belated report that an adult was seen on 1st March 1970, so that winter was not a blank one for the species as stated in WILDFOWL 21 (p. 133).

An adult arrived at Slimbridge on 13th December 1970 (an unusually early date) and was seen frequently until 20th February.

**Bean Goose** *Anser fabalis*

A family party of two adults and two young was seen on 31st December. A

single bird was sighted on 2nd February and last seen on the 18th. All were of the *rossicus* race.

**Pink-footed Goose** *Anser brachyrhynchus*

Up to nine Pinkfeet were present in January, being seen as a small flock on a number of occasions. From 5th February until the Whitefronts departed only one was seen.

**Barnacle Goose** *Branta leucopsis*

Four were seen on 4th January and five on the 10th, and subsequently to the 21st. Only one was seen on 4th February, two on the 8th and then one for the rest of the month.

M.A.O.

## SLIMBRIDGE: THE WILD SWANS 1970-71

The first Bewick's Swans came to Slimbridge early on 22nd October. They were a pair, Juan and Tobita, well established at Slimbridge in previous years, and their two cygnets. The family slept for most of the day, first feeding at 16.30, but left at 21.15, not to reappear until 26th December. This was the first of an interesting trend which developed later.

Arrivals were, in fact, fairly slow for the first fortnight, and by 6th November only 36 individuals had been recorded. The next day, however, it turned colder, there was a NE. wind, and 53 swans arrived. Pheasant and his mate, Partridge, gave us a rather inconclusive idea of from where they had moved. Pheasant's ring number had been read near Muiderburg in the Netherlands two days before, and in the flock of 430 there were three other ringed swans. Probably one of these was Partridge.

The increase continued fairly steadily for the next ten days, by when 232 swans, including 16 families, had been recorded, although no more than 154 had been on Swan Lake in one day. Of the parents, only two pairs and the females in another two pairs had never been recorded at Slimbridge. Only six families stayed, all of the parents having been to Slimbridge before, except for one of the females. She and her mate, incidentally, lost their only cygnet within three days of arriving. Of the families that left, all returned later in the season except the two in which both mates were new. The other new female never became confident, however,

and the family never became satisfactorily established. This confirms the impression gained last season that new pairs with cygnets tend not to stay at Slimbridge. However, previously well-established pairs did not return until between 19th and 27th December, when the weather became very much colder.

During November swans continued to arrive, but the next major influx was not until that cold week at Christmas when the families returned. During the second week in January there were frequently over 400 Bewick's Swans on Swan Lake in a day, and on 16th January a new record of 411 was reached. However, last season's peak was 404, so perhaps we have reached the top level of Bewick's that Swan Lake can hold.

Departures were hardly recognised as such for they began so early. Even before 16th January the weather started to become milder, and there was quite a lot of rain, which gradually began to flood the lower-lying fields. On 20th January 45 fewer swans came, and by the 28th 100 more had disappeared. Another 50 left on 7th February and 120 a week later; after 14th February the day total on the pond was only once over 50, and only one new swan appeared. This is a period when we normally expect a small influx of swans that have wintered further west. Last year 34 came, and the year before that 25. These remaining swans gradually left; the last four on 24th March.

The total number of Bewick's Swans recorded this season was 626, which was



another new record. The proportion of cygnets was 18%, which was an improvement on the past three years. The mean brood size was 2.1. Seven pairs had four cygnets each, although two of these families each lost one during the winter. Of the total, 280 were birds that had been here in previous seasons, which makes the return rate the highest ever (45% of total). The details are in Tables I and II.

This season, for the first time, there were three cases of swans that had missed three winters at Slimbridge reappearing. Their behaviour was interesting to note. Bailey, ringed as a cygnet in 1966-67, had lost all recollection of the place, for his behaviour was no different from that of any new swan. He had to get used to the buildings, the crowded pool and the regular appearance of the feeder. Whistle and Thistle were extraordinarily nervous. When last here, in February 1967, there were never more than 24 other swans present. This year there were 300, rising to over 400 during the month that they stayed. They took a full week to settle at all and still remained 'jumpy', and were one of the earliest departures, on 21st January. When Guy and Letty, here in late winter 1967, returned this January they hung back nervously until most of the swans had fed, before they did so. Conditions can not have been attractive to them, however, for they left that day,

dropping in again for a few hours a fortnight later.

This year we had a second example of a pair of swans becoming separated and finding each other again. Stars and Stripes had been coming to Slimbridge for four years, until last season, when, rather late, Stars came alone, from 24th February to 11th March. This winter they returned together on Christmas Day.

It was interesting to note the degree of tolerance that individual families show to their former offspring, and to what extent these offspring 'cling' to their families. This would seem to vary according to the individual pair, and not be dependent on whether or not they currently have cygnets. There were 15 unmated swans this season, whose parents also came, but one of these did not overlap with her parents, while another pair left the day their offspring flew in. Two (siblings) of the remaining 13 paid no attention to their father (perhaps because he had a new mate). The other 11 did associate with their parents; four arrived and left with them; one arrived with and left before them; three arrived alone and left with their parents; three travelled quite independently. But perhaps most interesting is to compare the behaviour of Pepper and Amber to that of Porgy and Bess. This year Pepper and Amber had with them two current cygnets, two

**Table I. Numbers of Bewick's Swans at Slimbridge 1963-64 to 1970-71, and annual breeding success.**

Season	Total of different swans seen	No. returning from previous years (Adult/2nd yr. only)	Cygnets		Mean brood size	Maximum on Swan Lake on one day
			No.	%		
1963-64	24	—	6	25	2.0	24
1964-65	74	13	16	22	2.7	56
1965-66	148	31	43	29	1.7	125
1966-67	336	68	97	29	2.7	224*
1967-68	342	102	31	9	1.6	199
1968-69	439	130	34	9	1.6	366
1969-70	570	238	41	7	2.1	404
1970-71	626	280	113	18	2.1	411

\* 271 birds were counted on 13th January 1967, mostly on the River Severn and Dumbles.

**Table II. Percentages of adult and second year Bewick's Swans returning to Slimbridge in seasons after the first sighting.**

Season of first sighting	Number seen for first time	Percentages of original total returning in subsequent seasons						
		2nd	3rd	4th	5th	6th	7th	8th
1963-64	18	72	61	61	50	39	33	28
1964-65	45	44	42	31	31	24	22	
1965-66	74	51	38	35	32	31		
1966-67	171	30	19	18	19			
1967-68	209	24	24	20				
1968-69	275	42	30					
1969-70	291	29						

cygnets of last year (the third died on 25th March 1971 in the River Dove Valley, Staffs.) and a cygnet of 1966. The last did not arrive with the others, but joined up with them. He was readily accepted in the family group, and there was never the slightest sign of discord. Porgy and Bess, on the other hand, had four cygnets this year. Eartha, a cygnet of 1968, met up with them, but as the season progressed her parents tried to discourage the association, and the cygnets began to join in on this. It appeared a reluctant ceremony. The cygnets pecked or made pecking motions in the gentlest manner, while at the same time slightly curving their necks and pointing their bills down at about 45° as in greeting recognition. Eartha stuck with them, despite this, but it will be interesting to see what the situation is next season.

We caught 187 swans and nine were found crash-landed around the grounds. Of these 92 had not been ringed before, which brings the total ringed at Slimbridge to date to 304. There were six catches (Plate XIV). While it was again found that it became more difficult to get the swans up the pipe later in the season, a last catch of 18 was managed on 10th February. As well as taking various measurements, weighing, ringing, and photographing each bird, we also took a blood sample and an X-ray. From the blood samples we hope to find out to what diseases the birds have been exposed, but we have not yet had the results of the analyses.

The results of the X-rays of 100 swans were depressingly interesting—24 carried lead shot. Of 18 cygnets, only one was carrying one pellet. Of four yearlings, two had shot (one pellet and three). The shot in 19 of the 78 adults ranged from one to five pellets (mostly Number 5 size, but one was S.G.). In two pairs both male and female carried shot, while three of the adults have at one time lost their mates (Caesar, now carrying five shot, has lost two wives).

Among swans recovered elsewhere this winter, one cygnet (from the Moors) carried two shot, and one adult (found injured at Welney and subsequently died at Slimbridge) carried four. The most disturbing point is that the International Wildfowl Research Bureau informs us that all swans are totally protected in all countries through which the Bewick's might pass, U.S.S.R., Finland, Poland, East Germany, West Germany, Sweden, Norway, Denmark, the Netherlands, Belgium, France, the U.K. and Ireland.

Clearly the law is being disregarded somewhere. As a final bit of gloom, an adult, picked up at Welney, was found to have ingested shot and died of lead poisoning.

This year all swans caught had their tails, scapulars and wing tips dipped in yellow dye, so that more would be learnt about their movements when away from Slimbridge. Being gilt-edged seemed to cause no social difficulties for the birds and certainly brought a touch of colour to Swan Lake. One enthusiastic swan-watcher was heard to inform her companion that it was the males who had yellow tails! We had some interesting reports, but they totalled very few of the 114 birds dyed, especially when some reports may well have been of the same bird. Yellow-tailed swans were seen at Blagdon (2) and Chew (1) reservoirs in Somerset as early as December, and probably were only two individuals. These could even have been daily commuters from Slimbridge, for swans certainly do commute, and it must require little effort. On 1st December 11 Slimbridge swans were identified at Hasfield Ham, 16 miles north. As I left, five took off, including Tim and Sparrow, and were already on Swan Lake when, 40 minutes later, I got back to Slimbridge.

Other sightings were again at Blagdon (2) and Chew (1) reservoirs in January, probably the same two birds; a single bird at Eglwys Nunydd, Glamorgan; and five on our reserve at Welney. They only stayed one day, however, and unfortunately their ring numbers could not be read. During the main exodus in February we expected a flood of reports, but instead the swans practically vanished. The postal strike didn't help, of course. Birds were seen at two places on the Somerset Levels (one at each), on the Whittlesey Washes, Northants. (4) and the Ouse Washes (2).

In March reports were fewer, indicating, along with the sharply declined numbers at Slimbridge, that the birds had left the country. They were from: Hensal Castle Lake, Glamorgan (1), the Ouse Washes (2), the Haddiscoe Levels, Norfolk (1) and Shingle Street, Suffolk (1). The observer managed to take a photograph at Shingle Street, and Rasco's identity was confirmed by the ring number.

Given that the average wintering population of Bewick's Swans in the British Isles is around 2,500, about one in twenty had a yellow tail and wing-tips. Yet out of 300 seen near Langport on the Somerset Levels on 17th February, only one



Figure 1. Map showing localities of marked Bewick's Swan recoveries (crosses) and sightings (dots).

was dyed, and there were only eight dyed swans left at Slimbridge that day. There was a peak of 420 swans on the Wexford Slob, Ireland, on 1st March, but none were dyed. A Darvic-ringed swan was seen on the South Slob as late as 15th and 16th March (when only three swans remained at Slimbridge). It was identified by ring number, along with a good drawing of the bill pattern, as Frobe. This swan first came to Slimbridge in 1969-70, but did not return this winter. Another Darvic-ringed swan had been seen in February at the wildfowl refuge at Kilcolman Marsh, Co. Cork, but the ring number is not known. The small number of dyed swans seen among up to 1,250 on the Ouse Washes was also surprising.

During the spring we received reports of dyed swans from various parts of Germany between the end of January and mid-April. Two were seen near Ammersum, close to the Dutch border, in late-January/early February, and eight near Itzehoe, north of Hamburg, in mid-February, and one in the Elbe estuary, west of Hamburg, at the end of March. The greatest congregation, however, was much further up the Elbe, near Dannenburg in West Germany and Dömitz in East Germany. Up to 13 dyed swans were seen by several observers, as well as two ringed in previous seasons. One observer managed to read the complete ring num-

bers of seven swans, and from his other information we identified another family with one cygnet, and a single bird. Dyed swans were present in this area, flitting infuriatingly between the two banks, from the end of January to the end of March.

Other sightings were one at the Krakower See (unknown date) and one on 3rd April and again ten days later on the west coast of Schleswig-Holstein, near the Danish border. Dafila Scott (p. 144) saw three dyed birds in Denmark and one ringed swan in the Netherlands in late March. Another dyed swan was reported in south Gotland, Sweden, on 11th April.

Finally we had reports from Estonia where two separate groups of flying swans each had one marked bird (on 10th and 23rd April), and another two were seen at Matsalu Bay on 27th April and 2nd May (possibly the same bird). Unfortunately the postal strike had hampered our efforts to circularise foreign ornithological institutes and although quite a start has been made we hope next year to get even more information.

Only two Whooper Swans came to Swan Lake this winter. They arrived on 22nd December and were extremely aggressive. However, despite this, they only stayed until 19th January, leaving with the first departure of the Bewick's.

Mary Evans

## SLIMBRIDGE: BEWICK'S SWANS IN THE NETHERLANDS AND DENMARK, MARCH 1971

### Itinerary and numbers

On 20th March an excursion was made to the area near Nijkerk, south-east of the Eem Meer in the Netherlands where I had seen swans in March 1970. A total of 111 Bewick's Swans was seen here in three groups. Further north at Strand Nulde, where large numbers of swans occur in autumn, there were none. The usual places along the river Yssel between Kampen and Zwolle were also visited, but due to the complete absence of flooding, there were no swans where there had been more than 300 last spring. At one place just to the east of the Veluwemeer near Kampen, there were four Bewick's in a field with some Mute Swans, but none on the Meer itself. Along the west coast of the south polder a pair of Bewick's were seen and further south near Muiderberg, a small group of 28 swans in a field behind a farm.

On 21st March these areas were re-visited as well as an area near Bunschoten where there was a group of 114 swans.

On 22nd March, in Denmark, the large shallow Lake Tissø, the estuary of the river Halleby at Rersø, and that of the river Tudea, in the west of Sjaelland were visited. The only swans seen were ten on the River Tudea.

On 23rd March, in Jutland, the reserve Vejlerne in the north-west was visited. About 100 Bewick's were seen on Lonnerup Fjord, and about 40 on Osterild Fjord, but none on the other fjords in the neighbourhood.

On 24th March a thick fog cut visibility to about 100 metres until mid-afternoon. Several places down the west coast were visited, and the roads closest to the water were taken, but no swans were seen or heard until the mouth of the Numinde Strom at the southern end of Ringkøbing Fjord. Here there was a group of 67. Further south, on the lake at Filsø, 44 were seen. Returning northwards, 50 swans were seen on West Stadil Fjord.

On 25th March, the area north of Rønde was visited. At the first place, the area round Kolind, four Bewick's were seen on the flooded fields by the river Ryom. On a small unlikely pond close to the main Randers-Grena road, and on the outskirts of the village of Fausing, 18 Bewick's were seen.

On 26th, 27th and 28th all the places north of Lemvig in the west of Jutland were re-visited. The numbers in all the

places were unchanged, except at Vejlerne where there were 214 on 26th March (108 on Osterild, 82 on Lonnerup and 24 on Arup Fjord). With good visibility a total of 58 was seen in one area near Harboør in the extreme west of Limfjorden that day, and on 27th March the 18 at Fausing had gone. The reserve Ulvedybnet near Aalborg had no Bewick's.

The numbers seen on my trip appear to have been affected by the spring weather conditions. In the Netherlands it was extremely mild until the beginning of March when there was a brief cold spell. This would have pushed on all swans passing through before the beginning of March, and it is likely that many of the swans did pass through early as it was so mild in England as well. The majority of swans left Slimbridge by the second week of February whereas in the spring of 1970 (also mild) they left at the end of February, and the year before that between 6th and 9th March. Of about 250 swans seen in the Netherlands (compared with about 450 last year) about 200 (80%) were close enough for individual recognition.

In Denmark there had also been a cold spell shortly before, and all inland waters had frozen. But by 22nd March, the weather was quite mild and on several days there was a considerable heat haze to add to the difficulties of identifying swans at a distance. In Sjaelland, six of the ten swans seen at Tudea were close enough for individual recognition. In Jutland, of a total of about 470 swans, only 170 or so were close enough (36%). This is significantly low compared with the Netherlands and is largely due to the different type of habitat in which the swans are found in Denmark.

### Recognition of Slimbridge-wintering swans

On this trip the likelihood of picking out Slimbridge swans was greatly increased, since 114 birds caught in the winter of 1970-71 had had their tails, scapulars and wing tips dyed yellow. One bird had been marked pink.

In the Netherlands out of 200 close enough for recognition only one near Bunschoten on 21st March was a Slimbridge swan. It bore a yellow plastic ring (G216) on its left leg, making it a 1969-70 cygnet of Prongy and Square. They, and her brother, Presco, had all returned to

Slimbridge this winter, but not her. If she does return, she will now be recognisable by face pattern and she has a mate which will also be recognisable.

In Denmark on 21st and 22nd March, a dyed Slimbridge swan, Muzzy, was seen at Tudea in west Sjaelland, having left Slimbridge on 2nd February. This bird was first reported by an ornithologist as painted purple on the primaries, and since Muzzy was the only swan dyed pink, it was only necessary to confirm her identity. None of the other five birds with her were familiar. Her mate Fuzzy unknown to her was still at Slimbridge having arrived there after her departure, but it is hoped that they may find each other again further north. Also on 22nd March two yellow-dyed swans were reported on Lonnerup Fjord in north-west Jutland. The following day I saw one of these close enough to identify it as Caesar who left Slimbridge on 12th February. (He has been visiting Swan Lake for seven winters.) Caesar was seen almost every day until 27th March when the second reported swan was re-sighted on the neighbouring Osterild Fjord, just too far away for certain identification. It was ringed on the left leg and may have been Ginty who left Slimbridge on 7th February. A third dyed swan was reported by a Danish ornithologist on Lonnerup Fjord on 28th March.

### Habitat

In the Netherlands all but ten of the Bewick's Swans seen were in flat fields where the grass appeared very green and shallow water was lying in a few places. Around Nijkerk, westwards towards Bunschoten, and near Kampen, the fields used were not more than a mile from open water and always at a distance from human habitation. Those seen near Nuijderberg were surprisingly close to a built-up area and were feeding in a small wet field behind a farmhouse, the occupants of which were not too pleased about the swans being there. They said 28 eat as much as three cows! The six swans seen along the west coast of the south polder were standing in the shallow water along the edge of the marshy area just inside the dyke. This shore is fringed with phragmites in many places and the swans were feeding in the more open places.

In Denmark, the habitat was in com-

plete contrast. All but 16 of the swans were on shallow water, either on fjords (large or small shallow lakes bordered by flat land) or on river mouths or small pools. The largest concentration of Bewick's was seen at Vejlerne on three shallow lakes. The depth almost all the way across these lakes is not much greater than the length of a swan's neck. The same sort of conditions prevail at Filsø, West Stadil and Stadil Fjords. Some of the other places differ in that they are on the edges of very large fjords such as Ringkøbing, Bøvling and Limfjorden. Along the Aggertange and Harboør Tange there were small numbers of swans on the shallow pools, and in the south of Ringkøbing Fjord swans were seen in the shallow water at the mouth of the Numinde Strom. In all these places the swans were far from human habitation with the exception of the pool at Fausing which was only about 30 metres by 20 and near a village and a main road. At Kolind, and Tudea in Sjaelland, the swans were grazing on wet fields near rivers, much as they do in England.

An interesting point about 'swan places' in Denmark is that few are visited regularly and even there the numbers may vary greatly from year to year. More Bewick's are seen in autumn when the migration appears to be more northerly.

### Conclusions

It has become clear from this trip that individual recognition of Bewick's Swans by the bill pattern alone has serious limitations in places such as Denmark where the swans cannot be approached to within 100 metres. So the value of dyeing swans is evident and it is in any case of great help even if swans cannot be identified individually. Rings would also have been extremely difficult to see in Denmark except when the birds were upending, and then they would seldom have been close enough for the number to be read.

### Acknowledgements

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*Dafila Scott*

## SLIMBRIDGE: CURATOR'S REPORT FOR 1970

The Collection now has 173 kinds of birds, numbering some 2,000 individuals. A novel addition has been a pair of Musk Ducks *Biziura lobata* presented by Perth Zoo, W.A. (Plate XIa). Unfortunately we have lost the last Blue Mountain Duck *Hymenolaimus malacorhynchos*. This fascinating bird is the only indigenous New Zealand duck that has failed to breed at Slimbridge. Indeed Slimbridge is the only place outside New Zealand where the birds have been kept successfully.

The 1970 breeding season produced nearly 800 fledged wildfowl at Slimbridge, of 88 different kinds. The results with the Ne-ne were the most successful recorded: 51 at Slimbridge, five at Peakirk and 41 in collections to which birds had been loaned. It would be safe to say that the improvements in these breeding results are due to two major factors. Firstly, the four ganders containing wild blood, sent to us from Pohakaloa, two each in 1962 and in 1967, have no doubt increased the virility of our breeding stock inasmuch as most of the young produced in the last two years are related to them. Secondly, we are much indebted to our honorary veterinarian, Patrick Humphreys, whose work in ascertaining the ganders capable of producing a satisfactory amount of semen for pairing with known laying females has been invaluable.

Concerning flamingos, the most successful result was with the Chilean flock, the largest we have—some 70 birds. In

1969 this had produced five birds reared to maturity from 30 eggs laid. In 1970 40 eggs were laid from which 25 chicks were hatched and 21 reared. A number of eggs were rolled out of nests. But it is a significant factor, that might well contribute to their breeding success, that this flock allowed the warden feeding them to walk amongst them and to replace the eggs.

The Andean Flamingos laid four eggs but none was fertile. The Greaters and Lessers both went in for sporadic nest building activities and finally the Greaters laid five eggs and reared three young (Plate XV). The Caribbeans made several concerted nesting efforts during the season but no eggs were laid.

The White-winged Wood Duck have been paired off. One pair has been left full-winged and put into the Guinness Aviary. Here they have been given a variety of nesting sites with the expert advice of Sam Mackenzie who sent them to us from Assam. The other pairs have been pinioned. One pair has been released in the 'Wood', where there are many natural nesting sites. The third pair are in the Rushy Pen Aviary (Plate XIb).

During the summer we were able, albeit some months late, to bring the new Food Store and Preparation Room, Workshop, Incubator Room and Propagation complex into use. We now have indoor accommodation for 40 broods of downies—a tremendous assistance in our English climate.

S. T. Johnstone

## PEAKIRK: CURATOR'S REPORT FOR 1970

The breeding season at Peakirk started on 3rd March with snow during the first month. This was followed by rain until the middle of May, when the weather changed to warm and dry for the remainder of the season. June was a particularly hot month, and the heat had an adverse affect on sitting hens.

The construction of the New Service Area Building commenced on 14th March, and work continued on this project until 4th July. During this period numerous upheavals took place in the sitting-hen-box area. Supervision of hens and hatching eggs had to be carried out under most difficult conditions in close proximity to both builders and members of the public in the car park. In view of

these conditions, results for the season are considered reasonable.

The first of the six pairs of breeding Ne-ne on the Neaverson Area laid two clutches of eggs and five young were successfully reared. Three Trumpeter Swan cygnets were reared for the second time at Peakirk. A further comparatively new species to breed was the Andean Goose.

Other more notable species bred included Fulvous Whistling Duck, Ross's, Cackling Canada and Red-breasted Geese, New Zealand Brown Teal, European Eider, Canvasback, Baer's Pochard and Maned Goose. In all more than 200 wildfowl of 44 kinds were reared.

P. B. Varady

## Slimbridge breeding results, 1970

<i>Species</i>	<i>Date of 1st egg</i>	<i>Eggs set under hens</i>	<i>Hatched by hen</i>	<i>Hatched in incubator</i>	<i>Hatched by parent</i>	<i>Reared by parent</i>	<i>Total reared</i>
Magpie Goose	7.7	11	2	5			3
Plumed Whistling Duck	3.6	22	0				—
Fulvous Whistling Duck	1.4			24	14		24
Black-billed Whistling Duck	10.5				15	5	10
White-faced Whistling Duck	5.6			25	10	3	28
N. Red-billed Whistling Duck	30.5			16	12	8	24
S. Red-billed Whistling Duck	24.4			55			36
Black Swan	5.2				2	2	2
Mute Swan	15.4					1	3
Black-necked Swan	11.2			3	5	2	5
Trumpeter Swan	2.4	2	0		1	1	1
Swan Goose	6.4			5			1
Western Bean Goose	1.5	6	0				—
Russian Bean Goose	27.4	10	3				2
Pink-footed Goose	26.4				7	7	7
European White-fronted Goose	12.6	17	5				5
Greenland White-fronted Goose	25.4	23	10		4	3	12
Lesser White-fronted Goose	20.4	22	13				13
Greylag Goose	2.4				20	20	20
Eastern Greylag Goose	2.5	5	0				—
Bar-headed Goose	25.4	22	6		8	7	13
Emperor Goose	1.5	5	0				—
Lesser Snow Goose	26.4				11	10	10
Greater Snow Goose	5.5	11	5		2		6
Ross's Goose	14.5	7	0				—
Giant Canada Goose	20.3				7	7	5
Lesser Canada Goose	19.4	6	5		5	5	10
Great Basin Canada Goose	8.4				1	1	1
Dusky Canada Goose	31.3				8	6	6
Cackling Canada Goose	26.4		10				7
Hawaiian Goose	3.2	120	54				51
Barnacle Goose	24.4				26	22	22
Black Brant	1.6	4					—
Red-breasted Goose	3.7	4					—
Ruddy Shelduck	7.4	10	1		10	8	8
Egyptian Goose	15.3			5	6	6	11
Abyssinian Blue-winged Goose	18.4	8	0	5			5
Andean Goose	16.4				5	4	4
Ashy-headed Goose	12.4				2	1	1
Greater Magellan Goose	24.3			3	6	5	8
Cereopsis	13.1				2	1	1
Patagonian Crested Duck	24.3	37	25		4	3	25
Andean Crested Duck	8.3	10	2	3			4
Marbled Teal	—			24			14
Cape Teal	—	6	0				—
Versicolor Teal	19.4	28	9				2
Puna Teal	24.5	5	0				—
Red-billed Pintail	3.5			7			5
Bahama Pintail	17.4	7	4	27	7	3	22
Chilean Pintail	—	10	9	5			13
Kerguelen Pintail	4.7	5	0				—
Northern Pintail	7.4	10	8	17	6	2	27
Chilean Teal	9.3			7	7	4	11
Australian Grey Teal	29.4	19	2				2
Chestnut-breasted Teal	24.4	21	6				6
New Zealand Brown Teal	26.4	12	0				—
Mexican Duck	12.3	5	2		4	2	4
North American Black Duck	11.4	14	6				4

<i>Species</i>	<i>Date of 1st egg</i>	<i>Eggs set under hens</i>	<i>Hatched by hen</i>	<i>Hatched in incubator</i>	<i>Hatched by parent</i>	<i>Reared by parent</i>	<i>Total reared</i>
Hawaiian Duck	24.3	35	18	7			25
Laysan Teal	17.4	19	5	4			8
Indian Spotbill	23.5	22	17				17
New Zealand Grey Duck	10.4	15	13				11
Pelew Island Grey Duck	21.4			12			11
Philippine Duck	8.5			18			18
African Yellowbill	20.3	11	8	3			11
Abyssinian Yellowbill	27.3	11	8	11			18
African Black Duck	14.3	9	0				—
Gadwall	18.4				80	60	60
Falcated Duck	24.5	17	4				4
European Wigeon	1.5	4	3	33			35
American Wigeon	26.5	22	5	8			12
Chiloe Wigeon	7.5	19	18	11			18
Blue-winged Teal	12.5	24	7				6
Cinnamon Teal	8.5	21	15				9
Garganey	—	10	0				—
Argentine Red Shoveler	9.5	7	0				—
Cape Shoveler	18.4	9	5				3
Common Shoveler	16.5	8	5	4			6
New Zealand Shoveler	27.5	8	7				6
Ringed Teal	3.4	18	9				8
European Eider	23.4	25	6	5			10
King Eider	8.6	5	0				—
Red-crested Pochard	23.4	22	8	3			9
Rosybill	—	4	4				3
South African Pochard	—	4	0				—
European Pochard	23.4	25	22	4			24
Redhead	—	5	2	7			9
Common White-eye	—	16	13	32			36
Baer's Pochard	13.6	9	7	10			16
Australian White-eye	18.4			15			13
New Zealand Scaup	1.5			15			13
Tufted Duck	—	9	7	16			20
Lesser Scaup	—	8	5	12			14
Muscovy	24.4			15	9	7	22
Greater Scaup	13.6	2	0				—
Brazilian Teal	10.5	2	2				—
Mandarin	28.4	25	12	59			39
North American Wood Duck	25.3	15	7	47			31
European Goldeneye	27.1	8	0				—
Smew	18.5	16	8				1
Red-breasted Merganser	28.5	13	3				1
North American Ruddy Duck	5.5	6	2		50	20	20
Chilean Flamingo	13.5				25	21	21
Greater Flamingo	12.6				3	3	3
Andean Flamingo	30.5				—	—	—
Crested Screamer	8.7				4	2	2



## Peakirk breeding results, 1970

<i>Species</i>	<i>Date of 1st egg</i>	<i>Eggs incubated</i>	<i>Eggs hatched</i>	<i>Young reared</i>
Fulvous Whistling Duck	18.6	7	7	3
Black Swan	10.3	4	0	—
Black-necked Swan	5.3	4	1	1
Trumpeter Swan	28.4	6	3	3
Swan Goose	12.4	8	1	0
Western Bean Goose	2.5	4	2	2
Pink-footed Goose	8.5	17	5	4
Greenland White-fronted Goose	29.4	16	0	—
Emperor Goose	13.5	11	3	3
Lesser Snow Goose	5.5	10	4	2
Ross's Goose	13.5	8	3	2
Taverner's Canada Goose	4.5	5	0	—
Cackling Canada Goose	13.4	12	6	6
Hawaiian Goose	3.3	9	7	5
Barnacle Goose	11.5	28	12	9
Black Brant	15.5	1	0	—
Red-breasted Goose	8.6	5	4	3
Cape Shelduck	20.3	13	4	2
Common Shelduck	13.5	28	18	18
Andean Goose	31.5	6	4	3
Ruddy-headed Goose	3.5	3	3	2
Lesser Magellan Goose	5.4	5	4	0
Greater Magellan Goose	9.5	4	3	3
Marbled Teal	30.5	6	3	3
Cape Teal	11.5	11	1	0
Red-billed Pintail	3.6	9	0	—
Bahama Pintail	25.5	7	1	1
Chilean Pintail	18.4	2	2	2
Northern Pintail	1.5	30	19	14
Chilean Teal	11.4	11	6	6
European Green-winged Teal	4.6	5	0	—
Chestnut-breasted Teal	17.4	15	0	—
New Zealand Brown Teal	21.4	9	1	1
North American Black Duck	11.5	7	3	2
Hawaiian Duck	1.5	9	2	0
Laysan Teal	24.4	21	10	5
Philippine Duck	14.5	15	7	5
Abyssinian Yellowbill	2.4	15	12	9
Gadwall	5.5	14	3	3
European Wigeon	14.5	28	12	10
American Wigeon	20.6	7	3	2
Chiloe Wigeon	8.5	9	0	—
Cinnamon Teal	30.5	1	0	—
Common Shoveler	11.5	25	17	14
European Eider	20.5	13	7	4
Red-crested Pochard	15.4	30	10	1
Rosybill	15.5	22	12	10
Canvasback	12.5	7	3	3
Redhead	16.5	10	6	4
Ferruginous Duck	28.5	6	6	1
Baer's Pochard	10.6	7	4	2
Australian White-eye	27.5	12	8	6
New Zealand Scaup	9.6	6	5	0
Tufted Duck	6.6	8	3	1
Lesser Scaup	20.6	7	7	0
Maned Goose	3.4	14	7	7
Mandarin Duck	19.4	49	26	24
North American Wood Duck	11.4	43	17	8
North American Ruddy Duck	19.5	15	8	2

### WELNEY: WILDFOWL REFUGE, 1970

The undoubted non-ornithological highlight of the year occurred on 7th November when Mrs. Ernest Kleinwort officially opened the Refuge and the new Observatory building, a two-storey breeze-block and wood building, with large plate glass windows sloping inwards from the top to keep the rain off them as much as possible. On the walls inside exhibition panels illustrate the history and wildlife of the Washes, and the significance of the area as prime habitat for wildfowl. The Observatory stands on the inner boundary bank overlooking the Washes and is connected with the road by a covered bridge spanning the Hundred Foot River. It looks out over shallow lagoons, floodlit at night, to the broad sweep of fields and water. It is entered by a box-bridge over the New Bedford River, constructed as a training task by a troop of 3 Field Squadron, Royal Engineers. Near the roadside end of the bridge stand Pintail House, the Warden's home, and Wigeon House, visitors' accommodation. By the end of the year the Trust's holding of Washes was 588 acres, plus a further 31 acres on lease. It also had the shooting rights on another 100 acres. The inner boundary bank, shielding the Washes near the Observatory from disturbance, was extended to 800 yards (Plates IX and X).

Ornithologically the Ouse Washes continue to rate as one of the outstanding areas in Britain. On 22nd January 1970 there was a count of 36,000 Wigeon, of which about 21,000 were on the Welney Refuge. Also present at Welney on the same day were about 2,000 Mallard, 450 Teal, 600 Pintail and 114 Bewick's Swans, truly a magnificent spectacle.

The Wigeon numbers remained high throughout February and much of March

with 14,000 on the Trust's land on 8th February and 16,000 on 14th March. Mallard rose to a peak of 3,500 on the latter date. Up to 300 Bewick's Swans were regularly feeding on the Refuge during January and March, part of the much larger flock of up to 900 that wintered on the Washes.

The breeding season on the Refuge was notable for the successful nesting of at least one pair of Ruffs, and other pairs may have tried. Five pairs of Black-tailed Godwits also bred and hatched young, the first time since 1957 that this species has bred successfully north of the Welney Road. This year, however, no Black Terns stayed. Numbers of breeding ducks were good, with up to 25 broods of Shoveler being seen, as well as three of Garganey and two of Pintail.

There was some standing water present on low fields as early as September but the Washes did not flood properly until the beginning of December. Nevertheless, duck numbers built up very satisfactorily in the undisturbed conditions on the Refuge. There were 2,000 Mallard and 450 Teal present at the beginning of October and these increased steadily until by the end of the year there were 3,000 Mallard and nearly 2,000 Teal. Wigeon first appeared in force in November with 5,500 on the 21st and 11,000 by 12th December. On the latter date there were 15,500 on the whole Washes. Other duck numbers remained fairly low and Bewick's Swans were not much in evidence until the end of December, when the bulk of the 350 present on the Washes moved on to the Refuge, many of them coming for grain put down in the pool in front of the Observatory.

M.A.O.

### EASTPARK REFUGE, CAERLAVEROCK, 1970-71

#### Barnacle Geese (Plate XIIa)

The first 40 Barnacle Geese were observed on 30th September on the merse opposite the Lochar Loup. A gradual increase in numbers took place during October: 7th - 60; 15th - 900; 21st - 1,250; 1st November 2,000.

By the end of November numbers rose to just over 3,000 but this was

clearly due to a gathering at Eastpark of all the Solway Barnacles and not as a result of migration at this date. Earlier in November several hundreds were established on Rockcliffe Marsh in Cumberland.

Throughout the winter numbers fluctuated, often on a daily basis. The maxima present at Eastpark in each of the winter months were: 21st October -

1,250; 22nd November - 3,200; 28th December - 2,800; 10th January - 2,250; 7th February - 1,300; 29th March - 2,990; 2nd April - 1,325.

With a great deal of work involved in the taking over of the farm, rehabilitating the buildings and organising the observation facilities, not as much time could be given to goose-observations themselves as desired. However, a start was made on the detailed observation of the feeding distribution and behaviour of the geese which will be one of the main research projects. The results are summarised in the table. It is interesting to note that the Barnacles spent nearly half of their feeding time on arable fields and mostly on Eastpark itself. The Chief Warden of the National Nature Reserve noted 10%,

and goose management policy.

Apart from Caerlaverock the other most regular area frequented by the Barnacles is Rockcliffe Marsh in Cumberland. Small numbers occur at other places on both sides of the Solway.

On the Scottish side of the Firth Southerness and Arbigland Estate areas are used on and off throughout the winter. The maximum flock recorded there in 1970-71 was in the order of 1,500 geese. Further west the birds frequently appear at Southwick Marsh, up to 650 feeding on the Mersehead Farm fields as well as on the marsh itself. A white Barnacle was with the flocks, having been seen for the first time in 1969-70. Apart from a few light brown-edged feathers on its back it is as white as a Snow Goose and it served

#### Observations on Barnacle Geese

Month	Observation days		Goose days	% on merse	% on Eastpark arable	% on other arable
	Present	Absent				
Oct.	26	0	28418	29.2	65.8	5.0
Nov.	24	1	22956	38.6	54.5	6.9
Dec.	22	0	61531	19.6	50.8	29.6
Jan.	17	4	40352	62.8	34.2	3.0
Feb.	15	11	7503	42.8	23.8	33.4
March	22	5	17392	83.4	16.6	—
April	10	12	5464	91.7	8.3	—
	136	33		52.5	36.3	11.2

3% and 7% on arable fields during the past three years.

The disturbance level for the feeding geese on Eastpark in the first winter of the establishment of the Wildfowl Trust Refuge was kept low. With the planned screening of the farm roadways by next winter it should be virtually nil. It would appear that this factor was responsible for the greatly increased use of the arable fields on the Refuge. The past winter was one of exceptional mildness and this might possibly also have influenced the choice of feeding area. During the change over of tenancy at Eastpark the merse was only partially grazed from June 1970 until the end of the growing season. It has been suggested that the longer than usual merse grasses deterred the Barnacle from feeding there and thus increased their use of the farmland. However, this would not explain their return to merse grazing from January onwards.

Future research in the next few years should provide answers to a lot of important questions relating to the winter ecology of the geese as well as providing a basis for a sound combined agricultural

and goose management policy.

#### Pink-footed Geese

The first 64 Pinkfeet of the winter were observed on 18th September. By the end of the month 1,000 were present and roosting nightly on the Blackshaw Bank. These birds fed well inland away from the foreshore until the close of the wildfowling season at the end of January. There seems little doubt that shooting pressure to the east of the Refuge at Brow Well and Priestside, to the north on Powhillon, and to the west on the N.N.R. shooting zone (although strictly controlled) keeps the Pinkfeet from feeding on the Refuge.

The biggest flock recorded on Eastpark to the end of January was 230 on 14th October. A fortnight after the end of the inland wildfowling season numbers of Pinkfeet feeding on Eastpark had risen to 2,500. A week later 3,080 were recorded two days after the cessation of wildfowling on the foreshore.

During March the minimum daily numbers of Pinkfeet on the Refuge was

1,300 and the maximum 2,780. On the 15th March 3,000 were counted on Rockcliffe in Cumberland and a further 1,000 to 1,200 were present along the Eastriggs to Priestside area. At this time also 3,000 were daily to be seen feeding on Kirkconnel Merse across the Nith from Glen-caple. This suggests a total of 10,000 Pinkfeet in the inner Solway at this time.

In April the maximum numbers on Eastpark were 1,000 and on 1st May 500 were still present, the last 47 geese being observed in the grass field next to the Avenue Tower on 6th May.

### Greylag Geese

The first eight Greylags were seen on 15th October. Small numbers up to a maximum of 26 were occasionally feeding on the Refuge throughout the winter months. Flocks up to 220 were regularly using the neighbouring farms, Newmains and Midtown. These geese roost further west from Eastpark than the other species and their favourite feeding grounds are on the fields at Lantonside towards Glen-caple. The maximum numbers observed there were 415 in February.

### Other geese

An adult Light-bellied Brent accompanied the Barnacle flock for most of the winter and an adult Snow Goose was present with the Pinkfeet on 6th and 7th December.

### Wild swans

The first four Whoopers were observed on 21st October. From 2nd to 16th November 13 Whoopers were on Nether Locharwoods pond which lies close in to the flood banking along the Lochar water.

Up to 62 swans wintered at Isle Stepps which is six miles flying distance from the Refuge. The flock had 24% young. Two Bewick's were reported at Carse-thorn, which lies five miles across the Firth to the west, briefly in December. On 10th January two adult Bewick's took up residence in a grass field near Clarence-field (half a mile east of the Refuge) and remained there for over five weeks. On 8th January 28 Bewick's appeared flying low, east to west along the Refuge Merse. They were calling very loudly and clearly and were viewed from 75 yards. A photograph taken by E. E. Jackson verified the observation. The swans were also seen close in to the Lantonside Merse having turned north, but a thorough search of the local swan areas in Dumfries and

Kirkcudbrightshire revealed no Bewick's. The previous maximum numbers observed in Dumfriesshire and SW. Scotland were a party of five during the 1920's.

### Ducks

Mallard and Wigeon were commonly seen over the Merses especially at high tide periods. Maximum numbers of duck noted on any one day during the winter were as follows: Shelduck 411; Pintail 38; Teal 75; Mallard 180; Wigeon 750; Shoveler 23; Goldeneye five; Red-breasted Merganser six.

### Waders

Golden Plover were observed daily, and odd Black-tailed Godwits and Whimbrel as well as Greenshank during August and September.

On 17th September a higher tide than average coincided with a strong SW. gale which brought the sea water over the Merses and up to the sea wall. A most spectacular gathering of waders took place in the grass field next to the Avenue Tower site: Bar-tailed Godwits 300; Lapwing 75; Golden Plover 50; Dunlin seven (still in summer plumage); Black-tailed Godwits six; Whimbrel two; Curlew 120; Oystercatchers 2-300; Redshank 20-30; Ringed Plover three.

A few of the Black-tailed Godwits remained but most winter further south. Good numbers of Bar-tailed Godwits were seen at high tide periods during the winter, a flock of 1,700 being counted in early December. The commonest small local waders were Knot and Dunlin. Greenshank were seen twice during the winter on the refuge.

### Raptors

Male Hen Harriers were seen singly on nine occasions between October and the first week in March. The lack of females is interesting and it would appear that they seek alternative wintering areas. Merlins were seen on eight different occasions during the winter. Kestrels were common throughout the autumn and early winter and Sparrow Hawks were also seen regularly during this period. One Peregrine was noted near Brow Well at the eastern end of the Refuge in January.

### Passerines

There is little cover for the less hardy woodland birds since the general Refuge is very flat with only hawthorn hedge cover, and no shelter from winds blowing

straight in from the Irish Sea. The most abundant birds were Linnet and Twite, Chaffinch, Corn Bunting, Reed Bunting, Dunnock, and in small numbers Robin, Goldfinch, House Sparrow and the occasional Wren.

Wheatears were seen regularly during the migration in the early autumn. Fieldfares with a very small number of Redwings appeared at the same period and the species remained during the winter

months in small numbers, especially the Redwing. A Great Grey Shrike appeared on the hawthorn hedge on the Saltcot road on 16th December.

#### Human visitors

Two hundred and ninety-two persons were escorted to see the geese. Facilities to deal with larger numbers will be ready for the coming winter.

*C. R. G. Campbell*

## BOOK REVIEW

### *The New Wildfowler in the 1970's*

Edited by Noel M. Sedgwick, Peter Whitaker and Jeffery Harrison. 350 pages. Photographs and line drawings, coloured frontispiece and eight plates. London: Barrie and Jenkins. £3.50.

This is more than an updating of 'The New Wildfowler' published in 1961. Not only have the chapters been revised, new ones have been added. These have increased the emphasis on conservation, reflecting the attitude of the responsible shooter in this day and age. Of the 32 chapters only 13 are directly concerned with the pursuit and kill. The rest deal with topics of general interest; identification, migration, feeding habits, rearing and ringing, wildfowl counts, the status of geese, conservation in Ireland, North

America, wildfowl refuges, local reserves, international co-operation. The close contact maintained between the Wildfowlers' Association of Great Britain and Ireland, under whose auspices the book is published, and the Wildfowl Trust is stressed by the fact that Peter Scott contributes frontispiece and preface, and other Trust officers and staff have written seven of the chapters. Jeffery Harrison, eminent in both bodies and recently the deserving recipient of an O.B.E., contributed four chapters himself. His wife, Pamela, is responsible for the 59 black-and-white plates, whose reproduction does not always do justice to her fine efforts.

All in all a very well-worthwhile volume which should be widely possessed and read.

*G.V.T.M.*

## Education

The wildfowl Collections are central to this third main aim of the Trust. If people are brought into contact with a multitude of varied, beautiful birds an educational process is begun. This can lead to a broad-based popular support for the birds' conservation in particular and Nature's in general. The hope also is that some of the thousands of summer visitors will return to our Refuges during the winter months and get to know and appreciate the migrant wildfowl in their full freedom. The need to attract large numbers of the general public to our Collections and Refuges is clearly of paramount importance. The 'market research' exercise described on p. 126 is thus of much interest.

While the visitors are held as a captive audience the opportunity can be taken of exposing them to further stimulation and

education by means of wall exhibitions. Mr. Jackson produced two such permanent displays in 1970. One, in the hall of the new entrance building at Peakirk (Plate XIIb) besides expounding the aims and activities of the Trust, sets out the history and present attractions of nearby Borough Fen Decoy and Welney Refuge. At the latter, the new Observatory (Plate IXb) was similarly equipped with an exhibition explaining how the Ouse Washes were formed and detailing their flora and fauna, in winter and summer. A third large, but temporary exhibition was prepared for the E.C.Y. and mounted at Weston-super-Mare. Another, prepared by Mr. Cook, was mounted in the Museum at Peterborough.

Rather more formal education was provided for organised parties from schools. Some 25,000 children came to

Slimbridge in this way, a considerable increase over last year. The very popular series of work-sheets was extended and will eventually be available in book form. The Field Studies Hostel of the Y.H.A. in Slimbridge continued to be a great success, in close association with our education department.

Links with our neighbouring universities were further strengthened when University College, Cardiff, appointed our Director of Research as honorary Professorial Fellow. Prof. Matthews again gave a course of lectures there, and the Zoology students spent several days at Slimbridge doing special projects. Mr. Humphreys continued his work towards a Ph.D., researching on the fertility of geese and on sperm structure. A second Ph.D. student, Mr. A. C. Gagnon, began a study of the innate differences in adaptability, with regards food and disturbance, among the many species of

wildfowl hatched at Slimbridge. At Bristol University, where other courses of lectures were given and student visits arranged, Mr. Whiten continued research for a Ph.D. on the visual acuity of birds, in relation to their navigational abilities. The research that Mr. Mattocks has completed for an M.Sc. at Bath, on goose digestion, is summarised at p. 107. The Loch Leven study provided the material of Mr. K. F. Laughlin's Ph.D. thesis on duck metabolism, at the University of Stirling; and, through birds reared by Dr. Kear, of Mr. A. J. Evans' Ph.D. thesis on fat deposition, at the University of Edinburgh. Other Universities assisted by undergraduate courses, by the examination of Ph.D. theses or by the provision of research material included Aberdeen, Aberystwyth, Bath, Birmingham, Durham, Leicester, Liverpool, London, Monash (Australia) and Oxford.

G.V.T.M.

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