

FIELD NOTES ON THE COOT.
WITH SPECIAL REFERENCE TO ITS WINTER MOVEMENTS
AND DIVING HABITS.

BY

GEOFFREY C. S. INGRAM, M.B.O.U.

AND

H. MORREY SALMON, M.C., M.B.O.U.

ALTHOUGH the distribution of the Coot (*Fulica a. atra*) in the breeding-season is limited by its requirements in the matter of nesting sites, it is, even so, by no means numerous in the west and south-west of Britain. It is therefore obvious that the immense flocks which assemble on the lakes and reservoirs of South Wales and south-west England must mainly be immigrants, exactly from where, however, it is difficult to decide.

Described in the *Practical Handbook* as "a partial migrant, northern birds migrating to southern latitudes, wintering in great numbers on lakes and larger ponds, especially in Mediterranean countries to North Africa, &c.", it is probable that the influx is from the north and east, a conjecture which receives some confirmation from the fact that a spell of severe weather in that area of Britain is immediately followed by a sudden increase in numbers here in the south-west. This movement is quite apart from the steady accretion which, beginning in October—sometimes the end of September—continues until December or January, after which the numbers gradually fall, until by the end of March all except the comparatively few residents have drifted away.

Local movements are also apparent in the middle of winter in most years, our records pointing to the arrival and departure of wandering birds, often in considerable numbers. Some of these fluctuations can be traced to weather conditions as already mentioned, but others are plainly not due to this cause.

It seems probable that our winter flocks must include many migrants from the Continent; it would be difficult to account for their numbers otherwise, and yet this surmise is only supported by one record of a bird ringed in Denmark as a nestling in June, 1929, and recovered in Ireland in November, 1931. But other evidence of migration or wandering is forthcoming from records of one seen south-east of the Dogger Bank, February 14th, 1930; a bird ringed as an adult in Kent in March, 1930, and recovered in Pas de Calais, France, July, 1931; three individuals from the Bardsey Light, North Wales, November, 1913, January, 1914, and October,

1919, and the recovery of the remains of European Coot from Labrador and Newfoundland.

We are informed by Mr. G. R. Humphreys that in Ireland there are six records of Coot striking the lights on the coast. Five of these are recorded by Barrington in his *Migration of Birds*, 1900, and the sixth was obtained on September 28th, 1908. One of these birds came from a west-coast light and the remaining five from the east coast. Nothing very certain can be deduced from these records except, perhaps, that as movement is more apparent on the east coast it possibly points to a more or less regular passage of birds crossing from Britain. Two of these birds were obtained in September, two in October and two in November and are interesting to compare with the Bardsey Light records.

On August 6th, 1933, when off the Pembrokeshire coast, we were surprised to find a Coot swimming on the sea a good ten miles from the mainland; very few, less than half a dozen pairs, are known to breed in that county.

These records are insufficient in themselves to do more than indicate a westward movement, but if the species is adequately ringed in the future—as it deserves to be—evidence may well be forthcoming supporting the suggested continental origin of a big percentage of the winter flocks.

We have examined a large number of birds which have either succumbed to adverse weather conditions, or been wantonly shot, as so many of them are, but so far have failed to find a single ringed bird. One cripple we tried to capture in order to put it out of its misery, evaded us by diving and swimming away under water with head and neck extended, legs trailing and using its wings to propel itself with slow and deliberate strokes.

On the Llanishen Reservoirs, both of which are of artificial construction, bare of vegetation and therefore impossible as breeding sites, we have watched this species regularly during the winter for the last twelve years. The size of the flocks here has varied greatly from year to year, the largest numbering well over six hundred, being present during December, 1927, while in 1933-34 three hundred and fifty was the maximum, also in December. On the other hand, during the winters of 1929-30, 1930-31, 1931-32 and 1934-35, the greatest number has been less than thirty, although elsewhere flocks appeared to be of the average size.

During this period of observation we have paid considerable attention to their diving activities, largely because of the fact that Dr. J. M. Dewar, in his book *The Bird as a Diver*, has

postulated interesting theories which, so far as we are aware, have neither been challenged nor confirmed elsewhere; his observations are, we believe, the only ones that have been published up to the time of writing.

Stated briefly, he suggests that the Coot is different from all other diving birds because the period of its dive contains no bottom time, i.e., the time spent on the bottom searching for and eating food. The Coot goes straight down, grabs a beakful of food and immediately returns to the surface with it. From the material he collected he makes an approximation of the relation of the time of a dive to the depth attained as ten seconds per fathom. This rule was worked out by him from observations made on birds diving in water ranging from one foot to seven feet in depth, and he states that "progress with increasing depths is, however, conjectural, since, as yet, no dives have been recorded in more than seven feet of water". With the object of carrying Dr. Dewar's observations forward a few stages we have for a number of years kept records of Coot diving, more especially in depths over seven feet. These records were all made in mid-winter when the weed had died down, and they were gathered from a reservoir of which we had a contoured chart which enabled us, by means of cross-bearings on the diving bird, to arrive at an accurate (within twelve inches) estimation of the depth. We have altogether timed with a stop-watch one hundred and seven different dives in series ranging from two to twenty-five dives by nineteen different birds. The comparatively small number of records is due to the fact that the Coot appears to favour water of less than seven feet depths when feeding. The following table, compiled from these records, is a summary of our observations to date. Each series of dives refer to an individual bird and where two or more birds have been timed at a given depth they are severally indicated by the letters A, B, etc.

TABLE OF DIVES OF THE COOT.

<i>Depth in ft.</i>	<i>Dives in secs.</i>	<i>Total secs.</i>	<i>Total dives.</i>	<i>Average dive (in secs.).</i>	<i>By Dewar's scale.</i>
5-6.	6, 6, 7, 6, 7, 6, 6.	44	7	6.3	8.3-10
6-7.	10, 10, 8, 11, 12, 11, 6, 8, 11, 9, 10, 9, 11, 12, 11, 11, 11, 10, 11, 11, 8, 12, 12, 10, 12.	257	25	10.3	10-11.7
8.	8, 6, 5, 9.	28	4	7	13.3
9-10.	A. 8, 8, 10, 8, 11, 9. B. 10, 8, 8, 8, 9, 9, 9.	96	11	8.7	15-16.7

TABLE OF DIVES OF THE COOT—(continued).

Depth in ft.	Dives in secs.	Total secs.	Total dives.	Average dive (in secs.).	By Dewar's scale.
10-12.	A. 17, 17, 18, 16, 17. B. 17, 15, 15, 17, 16, 16, 15, 15, 15.	226	14	16.2	16.7-20
12.	13, 11, 12, 13.	49	4	12.25	20
14.	15, 14.	29	2	14.5	23.3
15.	16, 15, 16.	47	3	15.7	25
18.	A. 16, 17, 18, 17, 16, B. 16, 21, 17, 19, 14, 16, 15.	202	12	16.8	30
21.	27, 25, 23, 24, 25.	124	5	24.8	35
21-22.	A. 20, 16, 19. B. 22, 24. C. 20, 22, 23, 20.	186	9	20.7	35-36.7
22-23.	A. 20, 18, 21, 20. B. 24, 20, 20.	143	7	20.4	36.7-38.3
24.	20, 22, 23, 20.	85	4	21.25	40

It is only at the depths of six-seven feet and ten-twelve feet that our records agree at all closely with Dewar's ten seconds per fathom rule, and at depths greater than twelve feet it is impossible to correlate our times to that rule.

It will also be noticed that the increase of time in relation to the increase in depth is not always constant. Regarding these discrepancies from the time and depth rule which we have found very constantly, not only in connexion with the Coot but also with other diving birds, we are forced to the conclusion that the difficulty or ease of obtaining food under water has a greater bearing on the duration of a dive than Dewar admits in his summing up when he states "the food factor can considerably shorten the periods of individual dives, it has little effect upon the average period of a series of dives and it does not prolong a dive by more than a few seconds".

If we admit that the times shown on our table for the six-seven and ten-twelve feet depths are the normal for the Coot because they bear a closer relation to Dewar's time-depth rule for this species, then our five-six, eight and nine-ten feet averages must have been obtained from birds finding an easy food supply, but, on the other hand, if we ignore the six-seven, ten-twelve and also the twenty-one feet averages, we get a reasonable progression of increasing time in relation to increasing depth from the remainder of the table up to twenty-four feet, as follows:—

Depth	5/6	8	9/10	12	14	15	18	21/22	22/23	24	feet.
Time	6.3	7	8.7	12.25	14.5	15.7	16.8	20.7	20.4	21.25	secs.

It would then appear that the following are above the average and due, we suggest, to extended bottom time arising from a difficulty in obtaining food immediately :—

Depth	...	6/7	10/12	21	feet.
Time	...	10.3	16.2	24.8	seconds.

The dives at twenty-one feet are interesting and rather confirm our theory, for the bird concerned swam out from comparatively shallow water where it had previously been working, and made five consecutive dives at one of the deepest spots on the reservoir. Although it brought up weed at each dive it was not much in comparison with the beakfuls usually obtained, and after these five dives the bird returned to shallower water where the food was, presumably, more plentiful, and easier to obtain. It will be noticed that the three longest dives we have recorded for this species were made by this bird, viz., two of twenty-five and one of twenty-seven seconds and yet the depth was only twenty-one feet. The greatest depths of from twenty-two to twenty-four feet only yielded averages of from 20.7 to 21.25 seconds from a total of twenty dives.

It is admitted that the material upon which we have based these notes is somewhat scanty, but records about which we had the slightest doubt as to the accuracy of either the depth or the time—and there were a great number—have been rejected. We intend to continue our observations and it is hoped that other observers who have the necessary facilities for obtaining accurate data will also turn their attention to specialized observation on this highly interesting species.