

HABITS OF THE DOUBLE-CRESTED CORMORANT
(*PHALACROCORAX DILOPHUS*) IN
RHODE ISLAND.

BY GEORGE H. MACKAY.

I FIRST visited West Island, Seconnet Point, Rhode Island, in April, 1869, and with three exceptions have passed a few days there every spring since. It was while there during April, 1870, that my attention was first attracted to the Cormorants which I often saw flying about (a few every day) and alighting on the water close to the breakers near the island. This frequency did not, however, continue, for after 1872 they ceased visiting the immediate neighborhood of the island and I have not seen one alight there since. I have, however, seen more or less of them in April every year flying past the island as they passed from one place to another. I soon learned something regarding their movements and roosting place, which was on the Cormorant Rocks, located three and a half miles west of Seconnet Point and three quarters of a mile southwest from Sachuest Point on the Newport shore.

Although often intending to visit these rocks for the purpose of securing some of the Cormorants, I have never done so until this year. I have nevertheless watched them on the island with the aid of the large glass and seen them many times come, just before sunset, to roost on the rocks above mentioned. During my shooting experience on the coast I have taken only a very few Cormorants, or Shags as they are commonly called, for the reason that I never went after them, and also because they usually avoid passing within gun shot of a boat. I remember shooting one, a lone bird, off a headland at Swampscott, Mass., many years ago (species not noted), and one on January 29, 1866, and two on February 8, 1866, in South Carolina (known there by the colored people as 'Nigger Geese'). On October 5, 1877, I shot a lone *Phalacrocorax carbo* on Nantucket Island, Mass., and still another of the same kind on April 21, 1889, off West Island, which comprise all I have ever taken.

It was during my recent trip to Seconnet Point, April, 1892, that I determined to visit the Cormorant Rocks, should the weather and sea be sufficiently favorable for making the trip, it requiring a calm sea and off shore wind in order to effect a landing. When other conditions prevail it is a most forbidding and dangerous place to attempt a landing, surrounded as it is with an impassable collar of surging surf and foam, while rising from the centre are the black jagged rocks surrounded by a nearly flat mesa-like apex crowned with a cap of Fusiyama whiteness as it glistens in the sunlight, but *not*, however, composed like it, of immaculate snow, but of *lime*. Such a day as I had wished and waited for was April 19, 1892, and as I rode at anchor in my little boat off the seaward side of West Island (which lies off the extreme point of Seconnet Point) shooting Scoters, the sea was calm, as it had been for the two days previously, and a gentle breeze blowing from the northwest completed the desired requirements. Perceiving a large cat-boat belonging to two Swedish lobster-men coming towards me, I motioned to them to come up in the wind, as I wished to board and speak with them. This they did, and I soon arranged for them and their boat to carry me to the rocks, to remain all day and return to West Island at night. Wishing to go on shore to secure a few things before starting I instructed them to stand off and on near the island and I would wave for them to come for me in their small boat when I was ready to start. We filled away about nine o'clock A. M., and just before ten o'clock, we were off the rocks. Putting my things into the small boat, one of the men rowed me to the rocks near at hand. After waiting awhile for a favorable opportunity to land, for it was breaking all around, in we went through the surf without taking in scarcely any water and landed on the rocks where I remained until sunset.

These low lying black rocks have been in the past, and are still, the resort and roosting place of all the Cormorants living in and around these waters, and as they undoubtedly received their name many years ago from such occupancy it may be interesting to know that on a map dated July 20, 1776, which is in an atlas called the 'American Neptune,' published in London in 1776, and surveyed by Des Barres, that these identical rocks are cor-

rectly shown and located under the name of the 'Cormorant Rocks.' It would not, therefore, seem unreasonable to infer that they were so named on account of being frequented by these birds at that early period, or even before. If such a conclusion is admissible it would show an occupancy of certainly one hundred and sixteen years, and possibly for a longer period, as well known local names are preserved when feasible in order to avoid confusion. There is, however, other evidence of long occupancy of still greater interest to the ornithologists, in the fact that I discovered, on careful examination, that many of the projections of the rock on the mesa top, which afforded good *standing* places, had apparently been worn *smooth* and *glossy* by long use. These resting places sloped down on the sides, affording the birds, when standing on them, convenient places for ejecting their excrement, there being invariably a deeper deposit of lime at their base than on other portions of the mesa top, which was also covered with such deposit to a greater or less degree.

On the flat top of the rock I found and saw a large number of curious *balls* (and brought fourteen away with me) varying from an inch to two inches in diameter and composed almost entirely of fish bones, chiefly the bones of young parrot-fishes (Labroids) and drums (Sciænoids)¹ firmly cemented together with gluten, hard in the dried specimens and soft and gelatinous in those more recent. One of the largest of the former, which was five and a quarter inches in circumference and quite black, while all the others were of a light color, contained three crabs (*Cancer irroratus* Say = *Panopeus sayi* Smith) in a fairly perfect condition, with some of the claws still remaining in place, showing they were probably swallowed whole. I am consequently inclined to the opinion, in the absence of absolute facts, that these birds, like the Owls, have the power of ejecting indigestible substances.

The Cormorant Rocks are of small area, the mesa top being only about thirty or forty feet square (estimated), the greater part of which is covered with a deposit of lime, its depth varying

¹I am indebted to Mr. Samuel Henshaw of the Boston Society of Natural History, and to Mr. Samuel Garman and Mr. Walter Faxon of the Museum of Comparative Zoölogy, Cambridge, for aid in identifying the composition of these balls.

from one-eighth of an inch to two inches. This portion of the rocks is the only part not washed by the waves, except during a severe storm. On it are three or four small pools of a few feet area, of greenish water, being an accumulation of rain water and drainage. Extending several hundred feet towards the southwest, and forming a part of the main rock, is a low black ridge of jagged rocks, over which the sea usually breaks with fury, lashing into foam the surrounding water. The only place where a landing can be effected, and then only in moderate weather, is on the inshore side of the high rock. The mesa top of the rocks seems to be the favorite spot for the birds to rest, although there are two other places lower down, one of which is separated from the main rock, on which I have frequently seen them standing. As may be supposed, on my arrival I found the odor was sufficiently strong to pervade the surroundings; it took, however, but a short time to become accustomed to it, and it caused me little or no inconvenience while I was there.

After a careful survey of my surroundings I selected as favorable a place as I could find for concealment, and sat down to await the coming of the birds. As the Cormorants leave these rocks between daylight and sunrise in quest of food and do not begin to return, except a few scattering birds, until about five o'clock P. M., especially if the weather is moderate and the sea calm, I had little hopes of seeing much of anything meanwhile. Nor was I disappointed, for I saw only six of the Double-crested, and three of the common Cormorants (*P. carbo*) in all, up to half past five P. M. I shot one (*P. carbo*), a lone bird, but in falling in the water close to the rocks the surf drove it into a cleft from which it was impossible to regain it, much to my regret. Of the Double-crested (*P. dilophus*) about a dozen were shot down, only five of which (all males by dissection) were saved, owing to the necessity of having to keep the large boat away at a distance of nearly half a mile, in order that it might not frighten the birds and prevent them from coming to the rock, there being no place where a small boat could be kept out of sight in safety. Therefore those that were shot down were only secured after considerable lapse of time, and only those birds which had been shot dead were recovered.

Although these Cormorants had probably been undisturbed for a long time (I have never heard of any one going after them)

previous to my visit, they were most vigilant, being noticeably careful in looking the rock well over and flying around it before coming within shooting distance. Those birds which were only wounded disgorged soon after striking the water, and I saw a Herring Gull (*Larus argentatus smithsonianus*) pick up and swallow an eel one of them had ejected after being shot down. All the Double-crested Cormorants (*P. dilophus*) obtained had eels (*Anguilla vulgaris* Turton) in their throats. In four of the birds the heads of the eels had been apparently torn off, and they rested in the throat in every instance in the form of a loop or ox bow, the two ends being nearest the stomach. In the fifth and largest bird an eel in perfect condition, measuring sixteen inches long and one inch in diameter, rested lengthwise in the throat with the tail at the mouth. Those taken from the other four birds were seven to ten inches long. It would therefore seem that eels constitute a large part of their food in this locality, at least at this time. I also picked up on the top of the rock an eel in a partially dried condition, minus its head, which was probably seven or eight inches long before the head had been torn off; it was in the form of an ox bow or loop, having dried as it was probably ejected. I am puzzled to know just where or how so many eels could have been obtained so early in the season. It is possible the birds may have discovered some spring hole near the mouth of some creek or river which, being warmer than the surrounding water, gave to the eels a vitality which they otherwise would not have had so early in the season; and the Cormorants having made such discovery, used it to their advantage. If so, I infer the birds must have performed the greater part of their fishing somewhere up the Seconnet River.

When approaching the rock the birds usually fly about and often completely encircle it before alighting. I also noticed that they were very apt to first alight in the water near at hand where they remained for a little while, especially if the weather was moderate, before flying up to roost on the rocks. This I have seen them do repeatedly. At the date of my visit (April 19, 1892) I should estimate the number of Cormorants frequenting these rocks, and which were apparently all Double-crested (*P. dilophus*) at about one hundred and fifty. Between half past five to six P. M. on April 19, 1892, I counted sixty in one flock,

twenty-five in another, eighteen in another, and scattering flocks of seven or eight each, down to a single bird (it is of course possible that I may have seen some birds more than once); and although the greater portion flew near enough for me to see them very plainly, I failed to detect any of the Common Cormorant (*P. carbo*) mingled with them. They seemed to make little disturbance of the air in flying with their slow measured movement of the wings, and it can be truly said that they came and went silently. While on the rocks observing them I failed to hear them utter any sound whatever. Their movement towards the rocks did not reach its height until quarter of 6 P. M. The greater part of the birds came from a northeast direction, and flew close to the water; those coming from the west were always flying higher up (100 to 150 feet), probably coming from a longer distance.

As I have before said, the birds leave the rocks in the morning, about sunrise or a little before, to go in search of food, as I have noticed those which passed West Island, flying towards the east, did so at about that time. My Swedish boatmen informed me that they had seen the Cormorants on the rocks early in March, 1892. While I was watching, a Double-crested Cormorant alighted in front of and near me on the rock. The movement was so light and graceful as to cause me much surprise, as I had heretofore regarded them as clumsy. This bird alighted with the ease of a Robin on a twig, and stood erect with legs straight and neck extended. On April 15, 1892, the first birds alighted on the rocks to roost at 6.02 P. M., and I counted eighteen in sight on the rock through the large glass. On April 16 the first bird alighted at 6.20 P. M., and one minute later there were eight, a flock of seven having come on. On this evening most of them seemed to come from the west, yet I believe that they must have passed around the rock to that side, flying so close to the water that I failed to perceive them as I looked through the large glass, as I believe that most of the birds must procure their living somewhere up the Seconnet River. On April 17 there were seven birds in sight on the rocks at 6.24 P. M. On April 18, at 5.22 P. M., there were about thirty in sight on the rocks, and at 6.15 P. M., there were forty or fifty. The north rock (of small area) was first covered with them;

those coming later located on the mesa top of the main high rock, before going to which I could plainly see them flying about the rock and alighting in the water. The formation of Cormorant Rock is such that it shelves towards the west, and I think there were undoubtedly many more birds there which I could not see, owing to my point of observation (West Island) being to the eastward of the rocks.

When wounded and on the water the neck is carried upright to its fullest extent, with the bill invariably pointed upward at an angle of forty-five degrees, giving the birds a most *snaky* appearance. As they are expert divers and swimmers, it is next to impossible to retrieve them when only wing-broken or wounded. When dead and floating they have less buoyancy than any water bird I ever shot, the head and neck sinking below the surface and apparently dragging down the body by their weight, so that the bird makes but little more show than a dead Old Squaw (*Clangula hyemalis*).

I was naturally curious to know what effect my invasion of their precinct had on these birds; so on the day after my visit to the rocks, and occasionally for several days following during the remainder of my trip, I looked for them through the large glass. At noon, on April 20, there were eighteen birds standing on the highest part of the mesa rock. These I think were probably some which had not come to the rocks during the time I was there, for with this exception they were the only ones I saw *on* the rocks during the remainder of the time (several days) I was at West Island. At sunset, on April 20, the birds were flying about the rock and alighting in the water as usual, the weather still continuing moderate and the sea calm; but none apparently dared to alight on the rocks, at least as long as it was light enough for me to see them through the glass, and considerable distrust had apparently been created as to the rocks being that place of security and rest they had been led by long occupancy to suppose. I, however, sincerely hope and believe that they will be well over their troubles long before next spring, and back to their customary home on the rocks as usual.

When flying south on migration, their manner of flight resembles that of migrating Geese. They first appear on the Massachusetts coast about the middle of August, the height of the

movement being in September, some of the flocks then numbering sixty or more birds. During such migration they are frequently mistaken for Geese or Brant, especially when passing over the land two to three hundred yards high. In very windy and rough weather they have been known to pass over the land very low down, in one instance within ten feet of the ground, but this is very unusual. Mr. Geo. A. Tapley of Revere, Mass., shot one of three (variety not noted) which were standing on the edge of a marsh in that place in the winter, at a time when there was much ice around. They were engaged in eating a sculpin (*Cottus scorpius* Linné, subsp. *grœnlandicus*); whether caught by one of them or found on the shore was not known; the belly and entrails had been eaten at the time he disturbed them.

The only other resort of these birds in Massachusetts or Rhode Island, of which I am aware, is on the 'Graves,' some rocks situated outside of Boston Harbor, Mass., a place which has also been a noted resting and roosting place for Cormorants for a great many years. Last year in this locality the flight of Cormorants was apparently large, the birds being more numerous than usual, but for some unknown reason very few remained at this resort. On some days five hundred to one thousand (estimated) birds have been known to pass this place while migrating south. They are very gregarious. The *Common* Cormorant (*P. carbo*), like the *Common* Guillemot or Murre (*Uria troile*), is *uncommon* on the Massachusetts and Rhode Island coasts, and is not often taken, as far as I am aware. The *Double-crested* Cormorant (*P. dilophus*), as I have here shown, is not at all uncommon.

The immature birds of *P. dilophus* are of a general brown tint all over, with a greenish shade on the back and upper tail coverts, the lower parts being light brown. The rounded end of the feathers which cover the entire back when the wings are folded are at this period but imperfectly defined, but in the fully adult bird they are dark drab gray, and contrast boldly and harmoniously with the beautiful dark velvety green of the rest of the adult bird's plumage. The adults of *P. dilophus* seem to vary considerably in size, judging from those I have seen, and the sexes are not distinguishable to the ordinary observer by their general appearance, being apparently alike. The downy young are dark brown all over.