

THE OYSTER-CATCHER OF THE ATLANTIC COAST OF
NORTH AMERICA AND ITS RELATION TO OYSTERS

BY IVAN R. TOMKINS

OYSTER-CATCHERS, in their specialized morphology, are much alike the world over, and there are no doubtful species. Their most definite character is the "oyster-knife" mandibles with the related modifications of head and neck.

It is my belief that the evolution of these specialized characters has attended a long-continued practice of feeding on bivalves, such as oysters and clams. Though some of the various species, now widely dispersed along the sea margins all around the globe, may have departed somewhat from the ancient mode of feeding and now live on food not requiring this specialization and this skill, the bird I know, the American Oyster-catcher (*Haematopus palliatus palliatus*)¹ of the south Atlantic coast of North America, continues to feed mainly on bivalves and to be limited in range by the accessible supply of this sort of food.

The facts on which this conclusion is based may be summarized in five general statements, with brief comment, as follows:

1. *Oysters and clams furnish a large portion of this oyster-catcher's food.* Clarence Cottam (*in litt.*) has provided information from the files of the Fish and Wildlife Service about stomach contents of birds taken in Virginia, North Carolina, South Carolina, and Georgia. Bivalves, such as oysters and clams, made up about 93 per cent, marine algæ and the remains of beetles making up the remainder. Cottam says: "The limited data indicates that this bird feeds to a large extent on bivalves or other molluscs. Oysters are commonly taken. In nearly all cases, however, only the fleshy parts of the animal are consumed and the outer horny calcareous covering rejected. Insects, primarily beetles, are taken rather commonly."

My own experience, so far as stomach contents are concerned, includes one young bird, still unable to fly, which contained five fair-sized oysters and one small gastropod, and two adults whose stomachs were filled largely with oysters. One of the adults contained also a pearl slug (doubtless swallowed with an oyster). I have also observed oyster-catchers work over an exposed oyster bed and search out small marine life much as a Willet (*Catoptrophorus semipalmatus*) or a Turnstone (*Arenaria interpres*) would do. They habitually linger on the oyster reefs long after these are uncovered by the tides—when all of the oysters would be closed.

¹ Peters (1934. "Birds of the World," vol. 2, p. 231) and R. C. Murphy (1936. "Oceanic Birds of South America," vol. 2, p. 977) place this form in the species *ostralegus*.

2: *The chosen habitat, summer and winter, is where suitable oyster beds are found.*

For about 20 years (1922–1942) my time was spent mostly in the region about the mouth of the Savannah River, from Tybee Light inland about 25 miles. My work was there, and my leisure was largely spent in exploring the vicinity and studying the animal life. During all these years I saw no oyster-catchers farther than a couple of miles from the oyster beds that are regularly exposed by the receding tides. They did not come into the wide salt marsh meadows, the fresh-water marshes, or the transition area along the river from salt to fresh water. The same has held true in the marshes and along the beaches of Glynn County, Georgia; of Charleston County, South Carolina; of Duval County, Florida; and the hundreds of miles of the Intracoastal Waterway between these points, all of which I have covered at various times.

3. *Oyster beds, to be suitable for oyster-catchers, must be covered and uncovered by the tides each day.*

Oysters will not prosper where they are not covered by saline water for a large portion of each day; oyster-catchers cannot obtain them unless they are uncovered long enough daily to allow the birds to wade out and find them open. The tidal range must be sufficiently great to ensure that the beds will not be covered by storm tides for days at a time. This is particularly important in the breeding season, for young birds might starve in a much shorter time than adults would.

4. *Where the tidal range is insufficient to allow daily feeding on bivalves, the oyster-catcher population is small or lacking; where optimum conditions for such feeding exist, there the population is largest.*

As one moves from Georgia north to the Capes of Virginia, or south toward Miami, Florida, the tidal range dwindles to a mean of about two and a half feet. With such a low tidal range, storm tides might cover the beds for several days at nearly any time.

The A.O.U. Check-List (4th ed., 1931) defines the status of *pallidus* as casual north of Virginia, and S. A. Grimes has informed me that the species is almost entirely lacking along the Florida peninsula from Daytona south. Reports by other observers indicate doubt whether there is any sizeable group on the Gulf Coast east of Mississippi.

The reentrant coast line from Cape Hatteras to Florida provides a mean tidal range of nearly seven feet in the central part, which usually ensures that the intertidal oyster beds will be uncovered daily, and in that area the oyster-catcher population is the greatest. Georgia and South Carolina south of Charleston now produce comparatively few oysters and, as a consequence, have small (though relatively stable) oyster-catcher populations, but north of Charleston, in the Cape Romain region, where oysters have continued plentiful, there are reports

of winter flocks of oyster-catchers totalling a thousand or more—as contrasted with the winter flocks of less than a hundred on the jetties at the mouth of the Savannah River, Georgia, and at the entrance to Charleston Harbor. The Cape Romain region is reported to have about 300 breeding pairs, whereas I doubt if there are more than 35 pairs on the coast of Georgia or between the Savannah River and Charleston. In 1938, Grimes told me that he estimated 6 pairs on the northeast coast of Florida. (It must be remembered that since the oyster-catcher is a large, conspicuous, and noisy bird, it is not difficult to make accurate estimates of a total population.)

5. *The oyster-catcher is largely non-migratory.* There is no direct evidence that our local birds (of the Savannah area) migrate farther south in the non-breeding season. I believe that after the nesting season they flock away to the rock jetties of the harbors and to the larger oyster reefs, which may not be near suitable nesting grounds. I believe that virtually the entire oyster-catcher population of the Atlantic Coast of North America—probably not more than two or three thousand birds in all—may be found in winter on the coast of South Carolina and Georgia.

Another phase of oyster-catcher activity of great importance is the exact method used by the American Oyster-catcher to obtain ingress to the live healthy oyster. For years I have questioned anyone who might know, naturalist or fisherman, about this matter, but without success. Some naturalists have even doubted that the birds are able to accomplish the feat. I find three accounts of the American Oyster-catcher's method of feeding on oysters:

“They would alight among the oysters [at Smithville, North Carolina] and when the bivalves gaped open, as is their habit when the water first leaves them, the birds would thrust in the point of their hard, flat bills, divide the ligament with which the shells are fastened together, then, having the helpless inhabitant at their mercy, would at once devour it.”—Maynard, 1881:366.

“I have seen it probe the sand to the full length of its bill, knock off limpets from the rocks on the coast of Labrador, using its weapon sideways and insinuating it between the rock and the shell like a chisel, seize the bodies of gaping oysters on what are called in the Southern States and the Floridas “raccoon oyster beds”—Audubon, 1835: 181.

“Many years ago in Florida I watched these birds feeding on the oyster-bars, disabling the small “coon” oysters with a clip of the powerful bill. These oysters are exposed at low tide, and the birds know how to open them as well as any professional oyster-opener. They feast on them until their flesh has the flavor of an oyster.”—Forbush, 1925:481.

All three quotations leave much to be desired, for they give no clear explanation of method. Actually, oysters *close* when "the water first leaves them"; Maynard appears to be in error on this point. Perhaps he meant: when the water first *covers* them, or: when the small swells of ebb tide bring the water level nearly down to them. From the accounts of Audubon and Forbush one gains an impression of woodpecker-like hammering far different from what I have seen. At no time have I observed the birds attempt to open oysters that were uncovered and hence completely closed.

"Raccoon" or "coon" oysters grow close together, are generally small because of crowding, and usually point upward—in contrast to "single" oysters, which have more room for growth, are larger, and frequently lie on their sides. Oysters that are feeding (which they do only when covered with water) open the valves slightly, perhaps an eighth of an inch. At other times the valves are held tightly together by the adductor muscle. The slightest touch or jar will usually bring the closing reaction.

The oyster-catcher takes advantage of the small opening, but is only able to do so at low tide levels, when it can walk or wade on the oyster bed while the oysters are feeding.

One day I watched from a car parked by a much-traveled highway, where the birds had learned some tolerance of traffic, as an oyster-catcher fed on oysters covered by roily water as the tide came in. The bird walked carefully among the oysters, often wading up to its belly. It probed the turbid water, apparently finding the oysters by touch rather than by sight. It would probe until (it appeared to me) the bill was entering between the valves of an oyster, press down, repeatedly tip the head from side to side, and soon lift the head with an oyster in plain sight between the mandibles, raising the bill to swallow. If the entire oyster had not been obtained the first time, the oyster-catcher would reach back to get the rest of it. The downward pressure could not have been great, certainly less than the weight of the bird. There was no woodpecker-like hammering, and no sudden thrust. The extreme edge of an oyster shell is very thin and fragile, and it seems that tipping the head sideways allows the bill to fulcrum against one valve and slide inward and downward against the crumbling edge of the other valve. As the head is tipped the other way, the process is reversed. As soon as the bill reaches well in between the valves, the tension on the adductor muscle is released and the flesh of the oyster easily obtained. In experiments trying to duplicate the oyster-catcher's feat, I found that a toothbrush handle whittled to a wedge could easily be slipped well down into an oyster provided the initial insertion was made before the valves closed tightly together.

No other bird of our coast has the mandibular development necessary to take advantage of this food in this manner. But the oyster-

catcher bill is only one of the important parts of body structure showing adaptation to this method of feeding. The size of the bird, development of neck muscles, the heavy feet, the ability to turn the bill almost straight downward—all these are parts of the assisting morphology.

The oyster-catcher's method of opening oysters would also be effective in obtaining limpets and clams for food, but clams are far more difficult to open than oysters. Baldwin (1946) reports a dead oyster-catcher found with its bill caught fast by a hard-shell clam (in Charleston County, South Carolina). It may be possible that feeding on clams (for example, where oysters are becoming scarce) introduces a lethal factor of importance.

The account in Witherby's "Handbook of British Birds" (vol. 4, 1940, pp. 414–415) refers to several published accounts of methods used by European Oyster-catchers (*Haematopus o. ostralegus*) to obtain ingress to mussels, oysters, limpets, and similar prey. These accounts indicate a wider diversity of food and feeding methods than I have reported here, but after careful consideration I believe the above analysis of feeding habits and habitat requirements to be essentially correct for *palliatu*s in the south Atlantic States.

My thanks for helpful information and friendly criticism are due to E. Burnham Chamberlain, G. Robert Lunz, Jr., S. A. Grimes, and others.

LITERATURE CITED

- AUDUBON, JOHN JAMES
1835 Ornithological biography (vol. 3). Edinburgh.
- BALDWIN, WILLIAM P.
1946 Clam catches oyster-catcher. *Auk*, 63:589, pl. 15.
- BENT, ARTHUR CLEVELAND
1929 Life histories of North American shore birds (part 2). *U.S. Natl. Mus. Bull.* 146.
- FORBUSH, EDWARD HOWE
1925 Birds of Massachusetts and other New England States (vol. 1). Mass. Dept. Agric.
- MAYNARD, C. J.
1881 The birds of eastern North America. Newtonville, Mass.
- 1231 EAST 50TH STREET, SAVANNAH, GEORGIA