afterwards 3 twelfths; the cœca, *i i*, 6 twelfths long, 3 twelfths broad, 4 inches from the extremity; the rectum, *i j k*, for 3 inches has a width of $4\frac{1}{2}$ twelfths, and terminates in a globular cloaca, *k*, 1 inch 10 twelfths in width.

The trachea is 11 inches long, from $5\frac{1}{2}$ twelfths to $4\frac{1}{2}$ twelfths in breadth, considerably flattened; its rings moderately firm, broad, 138, with 2 additional half rings. Bronchi of moderate width, one with 20, the other with 22 half rings. Lateral muscles large, as are the sterno-tracheal slips.

This species has a slender trigonal bone $10\frac{1}{2}$ twelfths in length, articulated to the crest of the occipital bone. The anterior part of the cerebrum tapers to a point much in the same manner as in the Turkey Buzzard, forming a similar lobe, 4 twelfths in height at its base, from the extremity of which comes off the olfactory nerve, which is about the 5th part of a twelfth in breadth, runs a course of half an inch along the septum of the eyes, and is distributed to the membrane of the nasal cavity, which is of a triangular form, 6 twelfths in length, 5 twelfths in breadth, with a single large turbinated bone. The external aperture of the nostrils is completely obliterated, its place being filled by bony matter. The large branch of the 5th pair of nerves passes in its usual direction to the anterior part of the upper mandible.

THE FLORIDA CORMORANT.

† PHALACROCORAX FLORIDANUS, *Aud.*

PLATE CCCCXVII.—MALE.

The Florida Cormorant seldom goes far out to sea, but prefers the neighbourhood of the shores, being found in the bays, inlets, and large rivers. I never met with one at a greater distance from land than five miles. It is at all seasons gregarious, although it is not always found in large flocks. The birds of this species never suffer others of the same genus to resort to their breeding places, although they sometimes associate with individuals belonging to different genera. The *P. Carbo* appropriates to itself the upper shelves of the most rugged and elevated rocks, whose bases are washed by the sea; *P. dilophus* breeds on flat rocky islands at some distance from the shores of the mainland; and the Florida Cormorant nestles

W.H.

Red-throated Diver

Male

Drawn from Nature by J. T. Audubon, F.R.S. &c.

With Printed & Coloured by J. T. Bowen, Phila.

on trees. In the many breeding places of all these species which I have visited, I never found individuals of one intermingled with those of another, although the Large Cormorant did not seem averse from having the Peregrine Falcon in its vicinity, while the Double-crested allowed a few Gannets or Guillemots to nestle beside it, and the Florida Cormorant associated with Herons, Frigate Pelicans, Grakles, or Pigeons.

This species seldom flies far over land, but follows the sinuosities of the shores or the waters of rivers, although its course towards a given point should thus be three times as long. It is the only one that, in as far as I have observed in America, alights on trees. My learned friend, the Prince of MUSIGNANO, mentions in his valuable Synopsis of the Birds of the United States, a species of Cormorant under the name of *P. Graculus*, which he describes as being when adult greenish-black, with a few scattered white streaks on the neck, in winter bronzed, and having a golden-green crest, the head, neck, and thighs with short small white feathers, and adds that it "inhabits both continents and both hemispheres: not uncommon in spring and autumn in the Middle States: very common in the Floridas, where it breeds, though very abundant in the arctic and antarctic circles." Unfortunately no dimensions are given, except of the bill, which is said to be three and a half inches long. The Florida Cormorant, however, does not at any season present these characters, and therefore conceiving it to be different from any hitherto described, I have taken the liberty of giving it a name, while the figure and description will enable the scientific to form a distinct idea of it, and thus to confirm the species, or restore to it its previous appellation, should it have received one.

On the 26th of April, 1832, I and my party visited several small Keys, not many miles distant from the harbour in which our vessel lay. Mr. THRUSTON had given us his beautiful barge, and accompanied us with his famous pilot, fisherman and hunter, Mr. EGAN. The Keys were separated by narrow and tortuous channels, from the surface of the clear waters of which were reflected the dark mangroves, on the branches of which large colonies of Cormorants had already built their nests, and were sitting on their eggs. There were many thousands of these birds, and each tree bore a greater or less number of their nests, some five or six, others perhaps as many as ten. The leaves, branches, and stems of the trees, were in a manner white-washed with their dung. The temperature in the shade was about 90° Fahr., and the effluvia which impregnated the air of the channels was extremely disagreeable. Still the mangroves were in full bloom, and the Cormorants in perfect vigour. Our boat being secured, the people scrambled through the bushes, in search of the eggs. Many of the birds dropped into the water, dived, and came up at a safe distance; others in large groups flew

away affrighted; while a great number stood on their nests and the branches, as if gazing upon beings strange to them. But alas! they soon became too well acquainted with us, for the discharges from our guns committed frightful havoc among them. The dead were seen floating on the water, the crippled making towards the open sea, which here extended to the very Keys on which we were, while groups of a hundred or more swam about a little beyond reach of our shot, awaiting the event, and the air was filled with those whose anxiety to return to their eggs kept them hovering over us in silence. In a short time the bottom of our boat was covered with the slain, several hats and caps were filled with eggs; and we may now intermit the work of destruction. You must try to excuse these murders, which in truth might not have been nearly so numerous, had I not thought of you quite as often while on the Florida Keys, with a burning sun over my head, and my body oozing at every pore, as I do now while peaceably scratching my paper with an iron-pen, in one of the comfortable and quite cool houses of the most beautiful of all the cities of old Scotland.

The Florida Cormorant begins to pair about the first of April, and commences the construction of its nest about a fortnight after. Many do not lay quite so early, and I found some going through their preparations until the middle of May. Their courtships are performed on the water. On the morning, beautiful but extremely hot, of the 8th of that month, while rambling over one of the Keys, I arrived at the entrance of a narrow and rather deep channel, almost covered over by the boughs of the mangroves and some tall canes, the only tall canes I had hitherto observed among those islands. I paused, looked at the water, and observing it to be full of fish, felt confident that no shark was at hand. Cocking both locks of my gun, I quietly waded in. Curious sounds now reached my ears, and as the fishes did not appear to mind me much, I proceeded onward among them for perhaps a hundred yards, when I observed that they had all disappeared. The sounds were loud and constantly renewed, as if they came from a joyous multitude. The inlet suddenly became quite narrow, and the water reached to my arm-pits. At length I placed myself behind some mangrove trunks, whence I could see a great number of Cormorants not more than fifteen or twenty yards from me. None of them, it seemed, had seen or heard me; they were engaged in going through their nuptial ceremonies. The males while swimming gracefully around the females, would raise their wings and tail, draw their head over their back, swell out their neck for an instant, and with a quick forward thrust of the head utter a rough guttural note, not unlike the cry of a pig. The female at this moment would crouch as it were on the water, sinking into it, when her mate would sink over her until nothing more than his head was to be seen, and soon afterwards both sprung

up and swam joyously around each other, croaking all the while. Twenty or more pairs at a time were thus engaged. Indeed, the water was covered with Cormorants, and, had I chosen, I might have shot several of them. I now advanced slowly towards them, when they stared at me as you might stare at a goblin, and began to splash the water with their wings, many diving. On my proceeding they all dispersed, either plunging beneath or flying off, and making rapidly towards the mouth of the inlet. Only a few nests were on the mangroves, and I looked upon the spot as analogous to the tournament grounds of the Pinnated Grouse, although no battles took place in my presence. A few beautiful Herons were sitting peaceably on their nests, the mosquitoes were very abundant, large ugly blue land-crabs crawled among the mangroves, hurrying towards their retreats, and I retired, as I had arrived, in perfect silence. While proceeding I could not help remarking the instinctive knowledge of the fishes, and thought how curious it was that, as soon as they had observed the Cormorants' hole, none had gone farther, as if they were well aware of the danger, but preferred meeting me as I advanced towards the birds.

The nest of the Florida Cormorant is of rather a small size, being only eight or nine inches in diameter. It is formed of sticks crossing each other, and is flat, without any appearance of finishing. All the nests are placed on a western exposure, and are usually completely covered with excrement, as are also frequently the eggs, which are three or four, and differ in size, their average length, however, being two inches and a quarter, their greatest breadth one inch and three and a half eighths. They are rendered rather rough by the coating of calcareous matter which surrounds them; but when this is removed, the real shell is found to be of a uniform fine light bluish-green tint. I was unable to ascertain the period of incubation. The young are at first blind, naked, black, and extremely uncouth. On placing some which were quite small on the water, they instantly dived, rose again, and swam about at random, diving on the least noise. If you approach them when about a month old, they throw themselves from the nest and plunge into the water. When undisturbed, they remain in the nest until they are fully fledged and able to fly, after which they undergo various changes, and are not perfect until nearly two years old.

Soon after they are left to shift for themselves, great numbers go to search for food in the quiet waters of inland streams. Thousands may now be seen on the lakes of the interior of the Floridas, and on the large rivers there. At this season many proceed as far as the Capes of North Carolina, the Mississippi, the Arkansas, the Yazoo, and other streams, including the fair Ohio, on which they are at times seen early in October, when they begin to return to the places of their nativity. During several weeks which I spent

on the St. John's river, while on board the United States' schooner-of-war Spark, I was surprised to see the number of these Cormorants already returning towards the keys, so much so that had I been the discoverer of that stream under similar circumstances, I should in all probability have named it Cormorant river. While we were at anchor near its mouth, they passed close to us in long single files almost continually, and, on reaching the sea, bore away towards the south along the shores.

On the Mississippi, in the month of October, when the temperature is considerably lower than in the Floridas, you see these birds during the day standing in their usual inclined position, on the sawyers and planters, as if resting there—so at least was the case in the autumn of 1820,—or on the dead branches of trees along the shores. In cloudy days they sailed high in the air, and in wide circles, after which, as if aware of cold weather being at hand, they swiftly followed in long lines the meandering course of the stream, at a considerable elevation. While sailing aloft, they frequently uttered a note not unlike that of the Raven in similar circumstances. When approached while standing on a planter, instead of taking to wing at once, although elevated several feet above the water, they prefer plunging first into the stream, when they almost instantly rise to the surface, paddle with their feet, and beat with their wings for twenty or thirty yards, and then rise into the air. Now and then, when of a sudden the weather becomes cold at night, you see them at early dawn join in numbers of fifty or perhaps a hundred, rise high in the air, arrange themselves in angular double files, and fly swiftly southward.

When in fresh water streams they fish principally in the eddies, and as soon as one of them is depopulated, or proves unworthy of their farther search, they rise and fly about a foot above the surface to another place, where they continue to fish. In the inner lakes of the Floridas they fish at random any where, and this is equally the case around the Keys, and on the bays and inlets along the coast. In fine calm weather, when the sun is pouring down a flood of light and heat, the Cormorants in flocks betake themselves to some clean sand-bar or rocky isle, or alight on trees, where they spread out their wings, and bask at times for hours, in the manner of Vultures and Pelicans.

The Florida Cormorant, like all the other species with which I am acquainted, swims deep, and dives with great expertness, so that it is almost useless to follow one when wounded, unless it has been greatly injured. On seeing an enemy approach, it first beats the water with its wings, as if in play, or as it would do if washing itself, raises both wings for a minute or more, then paddles off, and takes to wing. When on a lake, they prefer diving to flying, swim with all but the neck and head under water, in the

manner of the Anhinga or Snake-bird, and easily dive without shewing their backs.

They procure their food entirely by diving from the surface of the water, never from on wing, as some compilers assert; nay, the very form of their bill, and the want of air-cells, such as plunging birds are usually provided with, prevent them from darting from above into the water, as is the habit of Gannets and other birds, which seek for food on wing, go far out to sea, and stand gales such as the Cormorant, which rarely ventures out of sight of the shores, does not dare to encounter, or of those which, like Gulls, pass swiftly in curved lines over the surface, picking up their prey. On emerging, these Cormorants usually swallow their prey if it has been so seized as to enable them to do so with ease; if not, they throw it up to a short distance in the air, receive it with open bill, and gulp it head foremost. If the fish is large, they swim or fly to the shore, or alight on a tree with it, and there beat and tear it to pieces, after which they swallow it. Their appetite is scarcely satiable, and they gorge themselves to the utmost at every convenient opportunity.

The flight of this species is perhaps more rapid than that of the others, and is performed by continued flappings when the bird is travelling, but by alternate flappings and sailings of great elegance during the beginning of the breeding season, or when they collect in large flocks in lowering weather, sometimes also when about to alight. Their food consists chiefly of fish, and they generally prefer those of small size. While on the Florida Keys, I procured five specimens of the Hippocampus, fresh and uninjured, from the gullets of some of these Cormorants. They are hard to kill, and live to a great age.

They are easily treated in captivity; but their awkward movements on the ground, where they often use the tail as a support, render them less pleasing objects than other feathered pets. Besides, they eat and mute inordinately, and instead of charming you with songs, utter no sound excepting a grunt. Their flesh is dark, generally tough, and has a rank fishy taste. The Indians and Negroes of the Floridas kill the young when nearly able to fly, and after skinning them, salt them for food. I have seen them offered for sale in the New Orleans market, the poorer people there making gombo soup of them.

A bird of this species, which I shot near its breeding place, and which, on being examined, proved to be a female, had the feathers of the tail covered with delicate slender sea-weeds of a bright green colour, such as I have often observed on marine turtles, and which appeared to have actually grown there.

The slender feathers on the sides of the head fall off by the time incubation has commenced, and do not appear during winter, as is alleged by authors

when speaking of the crests or appendages of Cormorants, nor do they last more than a few weeks, as is also the case in the Egrets and Herons.

PHALACROCORAX FLORIDANUS, *Florida Cormorant*, Aud. Orn. Biog., vol. iii. p. 387; vol. v. p. 632.

Male, $29\frac{1}{4}$, $46\frac{1}{2}$.

Constantly resident in the Floridas and their Keys, and along the coast to Texas. The young in summer pass up the Mississippi and Ohio, returning in autumn to the sea. Abundant. Breeds on trees only.

Adult Male in spring.

Bill about the length of the head, rather slender, somewhat compressed, straight, with the tip curved. Upper mandible with the dorsal line slightly concave, until near the tip, when it is decurved, the ridge convex, and separated from the sides by a narrow groove, the sides erect, convex, the edges sharp and straight as far as the unguis, which is strong, convex above, incurved, acute. No external nostrils when full-grown. Lower mandible with the angle long and very narrow towards the end, filled by an extensible membrane, which extends a short way down the throat, its dorsal line a little convex, the sides erect and convex, the edges sharp and inflected, the tip compressed and obliquely truncate.

Head rather small, oblong, narrowed before. Neck long and slender. Body rather full, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with scales, of which the anterior and lateral are large and sub-hexagonal, the posterior very small and roundish. Toes all placed in the same plane, and connected by reticulated webs, covered above with very numerous oblique scutella; first toe smallest, fourth longest. Claws rather small, strong, compressed, acute, rounded above, arched, that of the third toe pectinated on its inner edge.

Plumage of the head, neck, lower parts, and posterior portion of the back glossy, blended, and silky, of the fore part of the back and wings compact, the feathers with narrow loose glossy margins. From behind the eye to the length of an inch and a half on each side, a line of extremely slender loose elongated feathers. Space around the eye, and to a large extent along the base of the bill, together with the small gular sac, bare. Wings rather small; primaries very strong, curved, rather narrow, tapering and obtuse, second longest, third almost equal, first longer than fourth; secondaries decurved, broad, broadly rounded, the inner narrower. Tail of moderate length, very narrow, much rounded, or cuneate, of twelve narrow rounded feathers, having extremely strong shafts.

Upper mandible black, along the basal margins bright blue; lower bright blue, curiously spotted with white. Iris light green, margins of eyelids light blue, spotted with white. Bare space on the head and gular sac rich orange. Feet and claws greyish-black. All the silky part of the plumage is greenish-black, at a distance appearing black, but at hand in a strong light green. The imbricated feathers of the back and wings greyish-brown, tinged with purple, their fringe-like margins greenish-black. Primary quills brownish-black, secondary like the other feathers of the wing. Tail brownish-black. The shafts of all the feathers brownish-black.

Length to end of tail $29\frac{3}{4}$ inches, to end of wings $25\frac{1}{2}$, to end of claws $28\frac{1}{2}$; extent of wings $46\frac{1}{2}$; wing from flexure $11\frac{3}{4}$; tail 6; bill along the back $2\frac{5}{12}$, along the edge of lower mandible $3\frac{7}{12}$; tarsus 2; outer toe $3\frac{5}{12}$, its claw $\frac{4}{12}$. Weight $3\frac{1}{2}$ lbs.

The Female is precisely similar to the male.

The young, after their first moult, have the bill dull yellow, the ridge of the upper mandible dusky, the unguis or hook horn-colour; the naked parts about the base of the bill rich yellow, the iris light green, the feet as in the adult. The feathers of the head and neck are blended, but not silky; the upper part of the head and the hind neck are brownish-black, tinged with green, the throat greyish-white, the fore neck and anterior part of the breast variegated with pale brownish-grey and black. The rest of the plumage is as in the adult, but the imbricated feathers of the upper parts of a lighter colour, but not bronzed.

W.H.

Florida Cormorant
Male

Drawn from Nature by J. T. Audubon, F.R.S. &c.

With Printed & Col^d by J. T. Bowen, Phila

Audubon, John James. 1843. "The Florida Cormorant, *Phalacrocorax floridanus*, Aud. [Pl. 417]." *The birds of America : from drawings made in the United States and their territories* 6, 430–437. <https://doi.org/10.5962/p.319530>.

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