BIRDS OF AMERICA.

THE

BIRDS OF AMERICA,

FROM

DRAWINGS MADE IN THE UNITED STATES

AND THEIR TERRITORIES.

BY

JOHN JAMES AUDUBON, F.R.S., &c., &c.

VOL. VII.

NEW YORK:
GEORGE R. LOCKWOOD,
LATE ROE LOCKWOOD & SON,
411 BROADWAY.

C. A. ALVORD, PRINTER.

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BIRDS OF AMERICA.

GENUS V.—FULIGULA. SEA-DUCK.

Bill about the length of the head or shorter, higher than broad at the base, depressed toward the end, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather pointed; upper mandible with the dorsal line generally declinate, but various at the base, being often prominent, the ridge broad at the base, narrowed at the middle, enlarged and convex at the end, the sides nearly erect at the base, gradually more declinate, the edges soft and internally lamellate, the unguis oblong and decurved; lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and straight, the edges internally lamellate, the unguis flat, obovato-elliptical. Nostrils sub-medial,

linear-oblong, rather large, near the ridge, in an oblong depression covered with the soft membrane of the bill. Head rather large, compressed, convex above; neck of moderate length, rather thick; body full, depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe; hind toe small, with an inner expanded margin; middle toe nearly double the length of the tarsus, outer a little shorter, all scutellate. Claws small, compressed, that of the first toe very small and curved. Plumage dense, firm, blended. Wings shortish, narrow, pointed, first and second quills longest; inner secondaries elongated and tapering. Tail very short, rounded or cuneate, of fourteen or more feathers. Œsophagus rather wide, considerably dilated at the lower part of the neck; stomach an extremely muscular, roundish gizzard; intestine long and wide; cœca long. Trachea of the males with a transverse, bony, unsymmetrical dilatation at the inferior larynx.

CANVASS-BACK DUCK.

FULIGULA VALISNERIANA, *Wils.*

PLATE CCCXCV.—MALE AND FEMALE.

The range of this celebrated Duck may be considered as limited on the one hand by the mouths of the Mississippi, and on the other by the Hudson or North river. Beyond the latter it is rarely seen at any season on our eastern coasts; and this circumstance, conjoined with its being now and then observed on the upper waters of our Western Districts, and its breeding in great numbers on the borders of Bear river, which flows into the salt lake of Timpanajoz in Upper California, as well as in the marshes and along the banks of streams in many parts of the Rocky Mountains, induces me to believe that the individuals of this species, instead of proceeding along the shores, pass overland towards their breeding grounds, however far northward they may be situated. According to Dr. RICHARDSON, it breeds in all parts of the Fur Countries, from the 50th parallel to their most northern limits.

Canvass Back Duck

1 Male 2 Female

VIEW OF BALTIMORE, MARYLAND

Drawn from Nature by J.J.Audubon,FRSFLS

Lith.Printed & Col.d by J.T.Bowen, Phila.a

While in our Atlantic Districts, it is found in much greater numbers on the Chesapeake and the streams that flow into it, than anywhere else. Indeed it is not more than twenty years since its regular appearance and sojourn on the waters of the Southern States has been observed or at least acknowledged. Although at New Orleans, where it goes by the name of *Canard Cheval*, it has been known to the oldest duck-shooters now alive, from their earliest recollection, it is not more than about fifteen years since it began to rise from a very low price to two dollars the pair, at which it sold during my visit in March, 1837.

This enhancement of its value I look upon as having arisen from the preference given to it by the epicures of our Middle Districts, who have strangely lauded it as superior to every other Duck in the world. This alleged pre-eminence has indeed become so deeply impressed on the minds of many of our Southerns, that they have on various occasions procured the transportation of numbers of Canvass-backs from Baltimore to Charleston in South Carolina, and even to Savannah in Georgia, although this species is by no means uncommon within a few miles of the latter city, as well as on the Great Santee river. I well remember that on my pointing out to a friend, now alas dead, several dozens of these birds in the market of Savannah, he would scarcely believe that I was not mistaken, and assured me that they were looked upon as being poor, dry, and very fishy, in short not half so good as Mallards, or Blue-winged Teals. With this I cordially agreed, for there, at that season, they are not better than represented.

I found this species in considerable numbers on and about the numerous inlets and rivers of East Florida; but did not see a single individual on the Gulf of St. Lawrence, along the coast of Labrador, or on that of Newfoundland.

It arrives in the neighbourhood of New Orleans from the 20th of October to the end of December, coming in flocks of eight or twelve, probably the members of a single family, and, unlike many other species, keeping in small groups during winter. At the approach of spring, however, they flock together, and about the first of April depart in large bodies. During their stay, they are wont to alight on wet prairies and muddy ponds in all open places, feeding on the seeds of various plants, of which may be particularized the wild oat and the water-lily.

According to ALEXANDER WILSON, who first described this species, their arrival in autumn in the Middle Districts takes place about the 15th of October; but more recent writers say, that "unless the weather to the north has been severe, the Canvass-back rarely appears till the middle of November." With this I fully agree, being convinced that their journeys to and from their breeding places are performed across the country. Were this

perfectly ascertained, it would prove that this species, unlike most other Ducks, instead of removing farther southward in autumn and winter, takes what may be called a lateral march toward our Eastern Districts, in which it remains until the weather has become too cold for its constitution, when it is forced a second time to migrate, and betake itself to warmer parts of the country, where it continues during the rest of the winter.

The flight of this species, although resembling that of our larger Sea-ducks in having the appearance of being rather laboured, is strong, rapid, at times very elevated, and well sustained. It swims deeply, especially when under apprehension of danger, and this probably the better to enable it to escape by diving, at which it is almost as expert as our sea or diving Ducks. But although its speed on the water is considerable, it moves rather heavily on land. Its food varies, according to the season and locality. The plant named *Valisneria*, on which it is said to feed when on the head waters of the Chesapeake, is not found equally abundant in other parts, and even there is at times so reduced in quantity, that this duck and several other species which are equally fond of it, are obliged to have recourse to fishes, tadpoles, water-lizards, leeches, snails, and mollusca, as well as such seeds as they can meet with; all which have been in greater or less quantity found in their stomach.

Nothing is known of its manners during the breeding season; and we are equally ignorant of the changes of plumage which, like other species, it may undergo at that period.

As I have not had very good opportunities of making myself acquainted with the modes in which the Canvass-backs are obtained for the markets, I here present an account of duck-shooting on the waters of the Chesapeake, published some years ago in the "Cabinet of Natural History," and of which a copy has been transmitted to me by its author, Dr. J. J. Sharpless, of Philadelphia, to whom, for this and other marks of attention, I offer my best thanks.

"The Chesapeake Bay, with its tributary streams, has, from its discovery, been known as the greatest resort of water-fowl in the United States. This has depended on the profusion of their food, which is accessible on the immense flats or shoals that are found near the mouth of the Susquehanna, along the entire length of North-East and Elk rivers, and on the shores of the bay and connecting streams, as far south as York and James rivers.

"The quantity of fowl of late years has been decidedly less than in times gone by; and I have met with persons who have assured me that the number has decreased one-half in the last fifteen years. This change has arisen, most probably, from the vast increase in their destruction, from the greater number of persons who now make a business or pleasure of this sport, as

well as the constant disturbance they meet with on many of their feeding grounds, which induces them to distribute themselves more widely, and forsake their usual haunts.

"As early as the first and second weeks in October, the smaller Ducks, as the Buffel-head, *Anas Albeola;* South-Southerly, *A. glacialis;* and the Ruddy or Heavy-tailed Duck, *A. rubida*, begin to shew themselves in the upper part of the bay; and by the last of the month, the Black-head. *A. Marila;* Widgeon or Bald-pate, *A. Americana;* Red-head, *A. Ferina;* and the Goose, *A. Canadensis*, appear, and rapidly distribute themselves down the bay. The Canvass-back, *A. Valisneria*, and the Swan, *Cygnus Americanus*, rarely, unless the weather to the north has been severe, appear in quantities till the middle of November. All these fowl, when first arrived, are thin and tasteless, from their privation during their migration, and perhaps preparatory arrangements, and require some days at least of undisturbed repose to give them that peculiar flavor for which some of them are so celebrated. During the low tides succeeding their arrival, the birds sit on the flats far from the shores, and rarely rise to the wing unless disturbed; but when the spring-tides render the water too deep for feeding, they commence their career, and pass down the bay in the morning, and return in the evening. Most of these fowl feed on the same grass, which grows abundantly on the shallows in the bay and adjacent waters, and has been called duck-grass, *Valisneria Americana*. It grows from six to eighteen inches in length, and is readily pulled up by the root. Persons who have closely observed these Ducks while feeding, say that the Canvass-back and Black-head dive and pull the grass from the ground, and feed on the roots, and that the Red-head and Bald-pate then consume the leaves. Indeed, although the Bald-pate is a much smaller bird than the Canvass-back, it has been seen to rob the latter, immediately on its return from under the water, of all its spoil.

"All these larger Ducks are found together when feeding, but separate when on the wing. That they feed on the same grass, is evident from the similarity of flavour; and those most accustomed to the article have a difficulty in deciding on the kind of Duck from the taste. Indeed, the Bald-pate is generally preferred by residents.

"By the middle of December, particularly if the weather has been a little severe, the fowl of every kind have become so fat, that I have seen Canvass-backs burst open in the breast in falling on the water; and spending less time in feeding, they pass up and down the bay from river to river, in their morning and evening flights, giving, at certain localities, great opportunities for destruction. They pursue, even in their short passages, very much the order of their migratory movements, flying in a line, or baseless triangle;

and when the wind blows on the *points*, which may lie on their course, the sportsman has great chances of success. These points or courses of the Ducks are materially affected by the winds, for they avoid, if possible, an approach to the shore; but when a strong breeze sets them on these projections of the land, they are compelled to pass within shot, and often over the land itself.

"In the Susquehanna and Elk rivers, there are few of these points for shooting, and there success depends on approaching them while on their feeding grounds. After leaving the eastern point at the mouth of the Susquehanna and Turkey Point, the western side of the Elk river, which are both moderately good for flying shooting, the first place of much celebrity is the *Narrows*, between Spesutie Island and the western shore. These narrows are about three miles in length, and from three to five hundred yards in breadth. By the middle of November, the Canvass-backs, in particular, begin to feed in this passage, and the entrance and outlet, as well as many intermediate spots, become very successful stations. A few miles further down the western shore is Taylor's Island, which is situated at the mouth of the Rumney, and Abbey Island at the mouth of Bush river, which are both celebrated for Ducks, as well as Swans and Geese. These are the most northerly points where large fowl are met with, and projecting out between deep coves, where immense numbers of these birds feed, they possess great advantages. The south point of Bush river, or Legoe's Point, and Robbin's and Rickett's Points near Gunpowder river, are fruitful localities. Immediately at the mouth of this river is situated Carroll's Island, which has long been known as a great shooting ground, and is in the rentage of a company at a high rate. Maxwell's Point, as well as some others up this and other rivers and even further down the bay are good places, but less celebrated than those I have mentioned. Most of these points are let out as shooting grounds to companies and individuals, and they are esteemed so valuable that intruders are severely treated.

"It has been ascertained that disturbing the fowl on the feeding flats is followed in most cases by their forsaking those haunts, and seeking others; hence, in the rivers leading to the bay near flying points, they are never annoyed by boat-shooting, either by night or day, and although the discharge of guns from the shore may arouse them for a time, they soon return; whereas a boat or sail in chase a few times, will make them forsake a favourite spot for days.

"From the great number of Ducks that are seen in all directions, one would suppose that there could be no doubt of success at any one of the points in the course of flight; but whilst they have such correct vision as to distance, and wide range of space, unless attending circumstances are favour-

able, a sportsman may be days without a promising shot. From the western side of the bay, and it is there the best grounds are found, the southerly winds are the most favourable; and if a high tide is attended by a smart frost and mild south wind, or even calm morning, the number of birds set in motion becomes inconceivable, and they approach the points so closely, that even a moderately good shot can procure from fifty to one hundred Ducks a day. This has often occurred, and I have seen eight fat Canvass-backs killed at one discharge into a flock, from a small gun.

"To a stranger visiting these waters, the innumerable Ducks feeding in beds of thousands, or filling the air with their careering, with the great numbers of beautiful White Swans resting near the shores, like banks of driven snow, might induce him to suppose that the facilities for their destruction were equal to their profusion, and that with so large an object in view, a sportsman could scarcely miss his aim. But, when he considers the great thickness of their covering, the velocity of their flight, the rapidity and duration of their diving, and the great influence that circumstances of wind and weather have on the chances of success, it becomes a matter of wonder how so many are destroyed.

"The usual mode of taking these birds has been, till recently, by shooting them from the points during their flight, or from the land or boats, on their feeding grounds, or by *toling*, as it is strangely termed, an operation by which the Ducks are sometimes induced to approach within a few feet of the shore, from a distance often of several hundred yards. A spot is usually selected where the birds have not been much disturbed, and where they feed at three or four hundred yards from, and can approach to within forty or fifty yards of the shore, as they will never come nearer than they can swim freely. The higher the tides, and the calmer the day, the better, for they feed closer to the shores and see more distinctly. Most persons on these waters have a race of small white or liver-coloured dogs, which they familiarly call the *toler* breed, but which appear to be the ordinary poodle. These dogs are extremely playful, and are taught to run up and down the shore in sight of the Ducks, either by the motion of the hand, or by throwing chips from side to side. They soon become perfectly acquainted with their business, and as they discover the Ducks approaching them, make their jumps less high till they almost crawl on the ground, to prevent the birds discovering what the object of their curiosity may be. This disposition to examine rarities has been taken advantage of by using a red or black handkerchief by day, and a white one by night in toling, or even by gently plashing the water on the shore. The nearest Ducks soon notice the strange appearance, raise their heads, gaze intently for a moment, and then push for the shore, followed by the rest. On many occasions, I have seen thousands

of them swimming in a solid mass direct to the object; and by removing the dog farther into the grass, they have been brought within fifteen feet of the bank. When they have approached to about thirty or forty yards, their curiosity is generally satisfied, and after swimming up and down for a few seconds, they retrograde to their former station. The moment to shoot is while they present their sides, and forty or fifty Ducks have often been killed by a small gun. The Black-heads toll the most readily, then the Red-heads, next the Canvass-backs, and the Bald-pates rarely. This also is the ratio of their approach to the points in flying, although, if the Canvass-back has determined on his direction, few circumstances will change his course. The total absence of cover or precaution against exposure to sight, or even a large fire, will not turn these birds aside on such occasions. In flying-shooting, the Bald-pates are a great nuisance, for they are so shy that they not only avoid the points themselves, but by their whistling and confusion of flight at such times, alarm others.

"Simple as it may appear to shoot with success into a solid mass of Ducks sitting on the water at forty or fifty yards distance, yet when you recollect that you are placed nearly level with the surface, the object opposed to you, even though composed of hundreds of individuals, may be in appearance but a few feet in width. To give, therefore, the best promise of success, old duckers recommend that the *nearest* Duck should be in perfect relief above the sight whatever the size of the column, to avoid the common result of over-shooting. The correctness of this principle I saw illustrated in an instance in which I had told to within a space of from forty to seventy yards of the shore, a bed of certainly hundreds of Ducks. Twenty yards beyond the outside birds of the dense mass, were five Black-heads, one of which was alone killed out of the whole number, by a deliberate aim into the *middle* of the large flock from a rest, by a heavy well-proved duck-gun.

"Before I leave the subject of *sitting-shooting*, I will mention an occurrence that took place in Bush river, a few years since. A man whose house was situated near the bank, on rising early one morning, observed that the river had frozen, except an open space of ten or twelve feet in diameter, about eighty yards from the shore, nearly opposite his house. The spot was full of Ducks, and with a heavy gun he fired into it. Many were killed, and those that flew soon returned, and were again and again shot at, till fearful that he was injuring those already his own, he ceased the massacre, and brought on shore ninety-two Ducks, most of which were Canvass-backs.

"To prevent the dogs, whilst toling, from running in, they are not allowed to go into the water to bring out the Ducks, but another breed of large dogs of the Newfoundland and water-spaniel mixture are employed. These animals, whilst toling is in progression, or at a point, take apparently as much

interest in success as the sportsman himself. During a flight, their eyes are incessantly occupied in watching the direction from whence the birds come; and I have frequently seen them indicate by their manner, the approach of a flock so distant that the human eye would have overlooked it. As the Ducks come on, the dog lies down, but still closely observing them, and the moment the discharge occurs, jumps up to see the effect. If a Duck falls dead, they plunge to bring it; but many of them wait to see *how* he fails, and whether he swims, and they seem to be as aware as the gunner, of the improbability of capture, and will not make the attempt, knowing from experience that a bird merely winged will generally save himself by swimming and diving. These dogs usually bring one Duck at a time out of the water; but a real Newfoundland, who was with me and my company this autumn, was seen on several occasions to swim twenty yards further, and take a second in the mouth to carry on shore. The indefatigability and ambition of these animals are remarkable, and a gentleman informed me he had known his dog bring, in the space of one hour, twenty Canvass-backs and three Swans from the water, when the weather was so severe that the animal was covered with icicles, and to prevent his freezing he took his great-coat to envelope him. Some dogs will dive a considerable distance after a Duck, but a crippled Canvass-back or Black-head, will swim so far under water, that they can rarely be caught by the dog; and it often has been observed, that the moment one of these Ducks if merely winged reaches the surface, he passes under, and however calm, cannot be seen again. To give an idea of the extreme rapidity with which a Duck can dive, I will relate an occurrence which was noticed by myself, and a similar one was observed by another of the party the same day. A male South-southerly was shot at in the water by a percussion-gun, and after escaping the shot by diving, commenced his flight. When about forty yards from the boat, he had acquired an elevation of a foot or more from the surface. A second percussion-gun was discharged, and he dived from the wing at the flash, and though the spot of entrance was covered by the shot, soon rose unharmed and flew.

"Canvass-backs, when wounded on the streams near the bay, instantly direct their course for it, and there nestle among the grass on the shores till cured or destroyed by Eagles, Hawks, Gulls, Foxes, or other vermin, that are constantly on the search. If a dead Canvass-back be not soon secured, it becomes a prey to the Gulls, which rarely touch any other kind. I have seen severe contests take place between crippled Canvass-backs and Gulls; and although a pounce or two generally prevents further resistance, sometimes they are driven off. If the bird is remarkably savoury, the Gull makes such a noise, that others are soon collected, when possession is determined by courage or strength.

"Another method of taking Ducks consists in placing gilling-nets under water on the feeding-grounds, and when they dive for food, their head and wings become entangled in the meshes, and they are drowned. This plan, though successful at first, soon drives the bird from these places; and in some cases, a few applications have entirely prevented their return for some weeks. Paddling upon them in the night or day produces the same effect, and although practised to some extent on Bush river is highly disapproved of by persons shooting from points. For the last three years a man has been occupied on this stream with a gun of great size, fixed on a swivel in a boat, and the destruction of game on their feeding-flats has been immense; but so unpopular is the plan, that many schemes have been privately proposed of destroying his boat and gun, and he has been fired at with balls so often that his expeditions are at present confined to the night. Sailing with a stiff breeze upon the Geese and Swans, or throwing rifle-balls from the shore into their beds, is sometimes successful.

"Moonlight shooting has not been a general practice, but as these birds are in motion during light nights, they could readily be brought within range by 'honking' them when flying. This sound is very perfectly imitated at Egg Harbour; and I have seen Geese drawn at a right angle from their course by this note. They can indeed be made to hover over the spot, and if a captive bird was employed, the success would become certain.

"Notwithstanding the apparent facilities that are offered of success, the amusement of duck-shooting is probably one of the most exposing to cold and wet, and those who undertake its enjoyment without a courage 'screwed to the sticking-point,' will soon discover that 'to one good a thousand ills oppose.' It is indeed no parlour sport, for after creeping through mud and mire, often for hundreds of yards, to be at last disappointed, and stand exposed on points to the 'pelting rain or more than freezing cold,' for hours, without even the promise of a shot, would try the patience of even FRANKLIN'S 'glorious nibbler.' It is, however, replete with excitement and charm, and to one who can enter on the pleasure, with a system formed for polar cold, and a spirit to endure 'the weary toil of many a stormy day,' it will yield a harvest of health and delight, that the 'roamer of the woods' can rarely enjoy."

Although this far-famed bird was named by its discoverer after the plant *Valisneria Americana*, on which it partially feeds when on fresh-water, its subsistence is by no means dependent upon that species, which indeed is not extensively distributed, but is chiefly derived from the grass-wrack or Eel-grass, *Zostera marina*, which is very abundant on the shallows and flats along the whole sea-coast. Its flesh seems to me not generally much

superior to that of the Pochard or Red-head, which often mingles in the same flocks; and both species are very frequently promiscuously sold in the markets as Canvass-backs.

In the plate are represented two Males and a Female. In the back ground is a view of Baltimore, which I have had great pleasure in introducing, on account of the hospitality which I have there experienced, and the generosity of its inhabitants, who, on the occasion of a quantity of my plates having been destroyed by the mob during an outburst of political feeling, indemnified me for the loss.

CANVASS-BACKED DUCK, *Anas valisneria*, Wils. Amer. Orn., vol. viii. p. 103.
FULIGULA VALISNERIA, Bonap. Syn., p. 392.
FULIGULA VALISNERIA, *Canvass-backed Duck*, Swains. and Rich. F. Bor. Amer., vol ii. p. 450.
CANVASS-BACKED DUCK, Nutt. Man., vol. ii. p. 430.
CANVASS-BACKED DUCK, *Fuligula valisneriana*, Aud. Orn. Biog., vol. iv. p. 1.

Male, 22, 33. Female, 20½, 30½.

Abundant during winter from the mouth of the Delaware to New Orleans, in all the estuaries. Columbia river. Breeds on the Rocky Mountains and northward.

Adult Male.

Bill as long as the head, deeper than broad at the base, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather narrow and pointed. Upper mandible with the dorsal line at first straight and declinate, then slightly concave, direct for a short space near the tip, where it is incurved, the ridge broad and concave at the base, narrowed at the middle, enlarged and convex at the end, the sides nearly erect and concave at the base, becoming anteriorly more and more declinate and convex, the edges curved upwards, with about 50 lamellæ, the unguis small and oblong. Nostrils sub-medial, linear-oblong, rather large, pervious, near the ridge, in an oblong depression covered with soft membrane. Lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and straight, the erect edges with about 55 inferior and 105 superior lamellæ, the unguis obovato-elliptical.

Head rather large, compressed, convex above. Eyes small. Neck of moderate length, rather thick. Body full, depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe, the rest reticulated with angular scales. Hind toe small, with an inner expanded margin or web; middle toe nearly double the length

of the tarsus, outer a little shorter. Claws small, compressed, that of the first toe very small and curved, of the third toe larger and more expanded than the rest.

Plumage dense, soft, blended. Feathers of the upper part of the head small and rather compact, of the rest of the head and neck small, blended, and glossy. Wings shortish, narrow, pointed; primary quills strong, tapering, the first longest, the second almost as long, the rest rapidly diminishing; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, or wedge-shaped, of fourteen feathers.

Bill black, with a tinge of green. Iris bright carmine. Upper part of the head, and a space along the base of the bill, dusky; a small transverse band of white on what is called the chin; the rest of the head, and the neck all round, for more than half its length, of a rich brownish-red. A broad belt of brownish-black occupies the lower part of the neck, and the fore part of the body, of which the posterior part is of the same colour, more extended on the back than under the tail. Back and scapulars white or greyish-white, very minutely traversed by undulating black lines; wing-coverts similar but darker. Alular feathers greyish-brown. Primary quills brownish-black, tinged with grey towards the base; the shaft brown. Secondaries ash-grey, whitish, and undulated with dark grey towards the end; five of them also having a narrow stripe of black along their outer margin. Tail brownish-grey, towards the end ash-grey. The lower parts white, the sides and abdomen marked with fine undulating grey lines, of which there are faint traces on most of the other feathers. The feet are greyish-blue, tinged with yellow.

Length to end of tail 22 inches, to end of wings 20, to end of claws 25; extent of wings 33; wing, from flexure, 9¼; tail 2$\frac{9}{12}$; bill along the back, measured from the tip of the frontal process to the end of the unguis, 3; lower mandible along the edge 2$\frac{7}{12}$; tarsus 1¾; first toe $\frac{6}{12}$, its claw $\frac{3}{12}$; middle toe 2$\frac{9}{12}$, its claw $\frac{5}{12}$; outer toe scarcely shorter; inner $\frac{7}{12}$ shorter. Weight 3¾ lbs.

Adult Female.

The female has the bill coloured as in the male; the iris reddish-brown; the feet lead-grey; the upper parts greyish-brown; the top of the head darker, its anterior part light reddish; the chin whitish; the neck greyish-brown, as are the sides and abdomen; the breast white; wing-coverts brownish-grey; primary quills greyish-brown, dusky at the end; secondary quills ash-grey, five of the inner with an external black margin, the innermost greyish-brown, like the back, and with some of the scapulars faintly undulated with darker. Tail greyish-brown, paler at the end; axillars and smaller under wing-coverts white, as in the male.

Length to end of tail, 20¼ inches, to end of wings 18½, to end of claws, 23½; extent of wings, 30¾; wing from flexure, 9½. Weight 2¾ lbs.

This species is very closely allied to the Pochard, or Red-headed Duck, *Fuligula Ferina*, but is much larger, and differs in having the bill proportionally higher at the base, and less dilated towards the end. The colours are also generally similar, but present differences. The upper parts of the Canvass-back are much whiter than those of the Pochard; the head of the former is dusky above, of the latter uniform with the neck; and the white spot on the chin is wanting in the Pochard.

The Digestive and Respiratory Organs of a male shot near Baltimore present the following characters.

The upper mandible is broadly and deeply concave. The tongue, which is thick and fleshy, as in other Ducks, is $2\frac{2}{12}$ inches long, its sides parallel, slightly sloping, and furnished with two series of bristly filaments; its base with numerous straight conical papillæ directed backwards, its upper surface marked with a broad median groove, the lower flat, its extremity formed by a thin semi-circular appendage, a quarter of an inch in length. The œsophagus passes along the right side of the neck, for six inches has a diameter of $\frac{5}{12}$, then dilates to $\frac{9}{12}$, so as to form a slight crop, again contracts as it enters the thorax, and in terminating forms the proventriculus, which is 1¾ inches in length, with oblong glandules, generally a twelfth of an inch in length. The stomach is a very large and powerful gizzard, of a broadly elliptical form, with extremely thick lateral muscles, the left being $\frac{11}{12}$ in thickness, the right $\frac{8}{12}$, the tendons large and strong. The transverse diameter of the gizzard is $2\frac{11}{12}$ inches, the longitudinal, from the cardiac orifice to the bulge of the inferior muscle, $2\frac{1}{12}$. Its cuticular lining is of very dense texture, and rugous; the grinding plates opposite the lateral muscles about half a twelfth thick, and slightly rugous. The intestine, which is 5 feet 9 inches in length, first forms in the usual manner the duodenal fold, at the distance of 5 inches from the pylorus, encloses the pancreas, receives the biliary ducts, and passing under the right lobe of the liver, proceeds backward beneath the kidneys, is convoluted in several large folds, and finally from above the stomach, passes in a direct course to the anus. Its coats are thick, its inner surface villous, and its diameter is considerable, being in the first part of the duodenum $\frac{9}{12}$, then for two feet from $\frac{5}{12}$ to $\frac{4}{12}$, enlarged again to $\frac{6}{12}$, and so continuing to the rectum, which is 6 inches long, ½ inch in diameter, and ends in an enlargement or cloaca, about an inch in diameter. The cœca, which commence at the distance of 6 inches from the anus, are 8 inches long, slender, $\frac{2}{12}$ in diameter for 3 inches, afterwards about $\frac{3}{12}$, with the extremity obtuse. The œsophagus and stomach contained young shoots of *Zostera marina*, and in the latter were numerous particles of quartz.

The trachea, when moderately extended, measures 10 inches in length, and is furnished with strong lateral or contractor muscles, a pair of cleido-tracheal, and a pair of more slender sterno-tracheal. Its diameter at the upper part is 4½ twelfths, it gradually contracts to 3½ twelfths, enlarges to 4½ twelfths, and at the distance of 7¼ inches from the upper extremity, forms a dilatation about an inch in length, and $\frac{7}{12}$ in its greatest diameter, but composed of distinct rings, then contracts to $\frac{3}{12}$, and ends in a bony and membraneous expansion, forming on the left side an irregular thin disk, convex towards the right, and flattened towards the left, where it is membranous. The expansions of the trachea are thus similar to those of the Red-breasted Merganser, but of less extent; the rings are of equal breadth on both sides, but alternately overlap each other, one side being partially concealed by the corresponding sides of those above and below it, while the other stands exposed. The lower larynx is formed of ten united rings, together with the bony and membranous expansion described. The tracheal rings, rather broad and osseous, are 118; the half-rings of the bronchi about 16.

RED-HEADED DUCK.

FULIGULA FERINA, *Linn.*

PLATE CCCXCVI.—MALE AND FEMALE.

At New Orleans, this bird is commonly known by the name of "Dos Gris." It arrives there in great flocks, about the first of November, and departs late in April, or in the beginning of May. On the lakes Borgne, St. John, and Ponchartrain, it is very abundant, keeping in large flocks, separate from the other species. In that part of the country its food consists of small fishes, in pursuit of which it is seen constantly diving. It is caught in different sorts of nets, and easily kept in confinement, feeding greedily on Indian corn, whether entire or crushed by the millstone. In 1816, many thousands of these Ducks, as well as others of different species, were caught in nets by a Frenchman, who usually sent them alive to market in cages from the narrows of the Lakes, especially from those called "La

pointe aux herbes," and the "Isle aux pins." So many of them, however, were procured by this man, that he after awhile gave up sending them alive on account of the great difficulty he encountered in procuring a sufficient number of cages for their accommodation.

Although Dr. RICHARDSON informs us that this species breeds "in all parts of the Fur Countries, from the fiftieth parallel to their most northern limits," I saw none of these birds during the spring and summer months which I spent on the coast of Labrador. I was equally unsuccessful in my search for it in Newfoundland. Indeed, I have never observed it eastward of the State of Massachusetts, although from thence it is more and more abundant the farther south you proceed, until you reach the tributaries of the Mississippi. Beyond the mouths of that river, these birds are rarely seen; and when I was there in April, 1837, none were observed by my party or myself after we had left the South-west Pass on our way westward. In Texas none were even heard of. From these circumstances I have inferred that, along with several other species, the Red-headed Duck reaches the Middle and Southern States by passing overland or following our great streams, such as the Ohio, Missouri, and Mississippi, westward, and the North river, and others eastward, both in its vernal and autumnal migrations. This I am the more inclined to believe, on account of the great numbers which on such occasions I have seen in ponds in the States of Illinois, Indiana, Ohio, and Kentucky.

I found it abundant in the marshes near St. Augustine, in East Florida, on the 8th of November, 1831, when the young males of that year had the breast and lower neck mottled with brown and blackish feathers; and yet whilst at General HERNANDEZ's, in that district, on the 20th of December, they were in almost perfect plumage. At this latter period they were shy, and kept in company with Mallards, American Widgeons, Scaup Ducks, and Spoonbills, generally in shallow fresh-water ponds, at some distance from the sea-shore. In South Carolina, these Ducks are now much more abundant than they were twenty years ago, especially on the Santee river, where my friend Dr. SAMUEL WILSON has shot many of them, as well as of the Canvass-back species.

The Red-headed Duck may be said to be equally fond of salt and fresh water, and is found in abundance, during its stay with us, on the Chesapeake Bay, especially in the month of March, when it associates with the Canvass-back and other Ducks, and is offered for sale in the Baltimore markets in great numbers. There I have seen them sold at 75 cents the pair, which was lower by 25 cents than their price at New Orleans in April, 1837.

Although they dive much and to a great depth, while in our bays and estuaries, yet when in the shallow ponds of the interior, they are seen

dabbling the mud along the shores, much in the manner of the Mallard; and on occasionally shooting them there, I have found their stomach crammed with young tadpoles and small water-lizards, as well as blades of the grasses growing around the banks. Nay, on several occasions, I have found pretty large acorns and beech-nuts in their throats, as well as snails, entire or broken, and fragments of the shells of various small unios, together with much gravel.

In confinement, they do not exhibit that degree of awkwardness attributed to them when on land. It is true that the habitual shortening of the neck detracts from their beauty, so that in this state they cannot be said to present a graceful appearance; yet their aspect has always been pleasing to my sight. Their notes are rough and coarse, and bear less resemblance to the cries of those species which are peculiar to fresh water than those of any other of their tribe. Their flight is performed in a hurried manner, and they start from the water pell-mell; yet they can continue very long on wing, and the motions of their pinions, especially at night, produce a clear whistling sound.

The fine pair from which I made the two figures in the plate were given me by my friend DANIEL WEBSTER, Esq., of Boston, Massachusetts, whose talents and accomplishments are too well known to require any eulogium from me.

The flesh of this bird is generally esteemed, insomuch that many persons know no difference between it and that of the Canvass-back Duck, for which it is not unfrequently sold; but I look upon it as far inferior to that of many other Ducks. Individuals of both sexes vary much in size. On comparing American with European skins, I am unable to perceive any difference of colour or proportions indicative of specific distinction.

RED-HEADED DUCK, *Anas Ferina*, Wils. Amer. Orn., vol. viii. p. 110.
FULIGULA FERINA, Bonap. Syn., p. 392.
FULIGULA FERINA, Swains. and Rich. F. Bor. Amer., vol. ii. p. 452.
RED-HEADED DUCK or POCHARD, Nutt. Man., vol. ii. p. 434.
RED-HEADED DUCK, *Fuligula Ferina*, Aud. Orn. Biog., vol. iv. p. 198.

Male, 20, 33. Female, 21, 32½.

Breeds throughout the Fur Countries, from which it migrates southward in early autumn. Abundant on the Chesapeake, New York Bay, Ohio, and Mississippi, with their tributaries. None seen westward of the Mississippi.

Adult Male.

Bill as long as the head, deeper than broad at the base, the margins parallel, slightly dilated towards the end, which is rounded, the frontal angles rather narrow and pointed. Upper mandible with the dorsal line at

Nº 11

Red-headed Duck

1. Male. 2. Female.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

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first straight and declinate, then slightly concave, direct for a short space near the tip, where it is incurved, the ridge broad and concave at the base, narrowed at the middle, enlarged and convex at the end; the sides nearly erect at the base, becoming anteriorly more and more declinate and convex, the edges curved, with about 45 lamellæ, the unguis elliptical, and abruptly rounded at the end. Nostrils submedial, oblong, rather large, pervious, near the ridge, in an oblong depression covered with soft membrane. Lower mandible flattened, being but slightly convex, with the angle very long and rather narrow, the dorsal line very short and slightly convex, the erect edges with about 55 inferior lamellæ; the unguis obovate and abrupt.

Head rather large, compressed, convex above. Eyes small. Neck of moderate length, rather thick. Body full, depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with narrow scutella continuous with those of the middle toe, and having another series commencing half-way down and continuous with those of the outer toe, the rest reticulated with angular scales. Hind toe small, with an inner expanded margin or web; middle toe nearly double the length of the tarsus, outer a little shorter. Claws small, compressed, that of the first toe very small and curved, of the third toe larger and more expanded than the rest.

Plumage dense, soft, blended. Feathers of the upper part of the head small and rather compact, of the rest of the head and neck small, blended, and glossy. Wings shortish, narrow, pointed; primary quills strong, tapering, the first longest, the second almost as long, the rest rapidly diminishing; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, or wedge-shaped, of fourteen feathers.

Bill light greyish-blue, with a broad band of black at the end, and a dusky patch anterior to the nostrils. Iris orange-yellow. Head and neck all round, for more than half its length, of a rich brownish-red, glossed with carmine above. A broad belt of brownish-black occupies the lower part of the neck, and the fore part of the body, of which the posterior part is of the same colour, more extended on the back than under the tail. Back and scapulars pale greyish-white, very minutely traversed by dark brownish-grey lines; the sides and abdomen similar, the undulations gradually fading away into the greyish-white of the middle of the breast; upper wing-coverts brownish-grey, the feathers faintly undulated with whitish toward the end. Primary quills brownish-grey, dusky along the outer web and at the end; secondaries ash-grey, narrowly tipped with white, the outer faintly tinged with yellow, and almost imperceptibly dotted with whitish, four or five of the inner of a purer tint, tinged with blue, and having a narrow brownish-black line along the margin; the innermost like the scapulars, but more

dusky. Tail brownish-grey, towards the end lighter. Axillar feathers and lower wing-coverts white. Feet dull greyishblue, the webs dusky, the claws black.

Length to end of tail 20 inches, to end of wings 18½, to end of claws 22; extent of wings 33; wing from flexure $9\frac{7}{12}$; tail $2\frac{8}{12}$; bill along the ridge 2, from the tips of the frontal processes $2\frac{4}{12}$; tarsus 1½, first toe and claw $\frac{10}{12}$; second toe $1\frac{6}{12}$, its claw $\frac{9}{12}$; third toe $2\frac{5}{12}$, its claw $\frac{11}{12}$; fourth toe $2\frac{6}{12}$, its claw $\frac{9}{12}$. Weight 2½ lbs.

Adult Female.

The female has the bill of a dusky bluish-grey, with a broad band of black at the end, and a narrow transverse blue line, narrower than in the male. Iris yellow. Feet as in the male, the head and upper part of the neck dull reddish-brown, darker above, and lighter on the fore part of the cheeks and along a streak behind the eye. The rest of the neck all round, and the upper parts in general, are dull greyish-brown, the feathers paler at their extremity; the flanks and fore part of the neck dull reddish-brown, the feathers broadly tipped with pale greyish-brown. The wings are as in the male, but of a darker tint, and without undulations. The tail as in the male. Lower wing-coverts light grey, those in the middle white; middle of breast greyish-white; hind part of abdomen light brownish-grey.

Length to end of tail 21 inches, to end of claws 23½; extent of wings 32½. Weight 2 lbs. 7 oz.

The following account of the digestive organs is taken from a *British specimen*, an adult male, examined by Mr. MACGILLIVRAY in March 1836.

The tongue is 1 inch and 10 twelfths long, 6½ twelfths broad, its sides furnished with two series of bristly filaments. The œsophagus is 11 inches long, with a diameter of nearly 5 twelfths at the top, 8 twelfths at the lower part of the neck. The proventriculus has a diameter of 9 twelfths; its glandules are cylindrical, and 2 twelfths long. The stomach is an extremely powerful gizzard, of an elliptical form, compressed, oblique, its length 2½ inches, its breadth $1\frac{3}{4}$; its lateral muscles more than half an inch thick; the cuticular coat rather thin, but very tough, slightly rugous, with two circular thicker parts opposite the centres of the lateral muscles. The upper part forms a small sac, from which the duodenum comes off; the pylorus without valve. The intestine is 5 feet 4 inches long, narrowest in its upper part, where its diameter is 4 twelfths, widest at the middle, where it is 6½ twelfths, near the cœca $\frac{5}{12}$. The rectum is 5½ inches long, its diameter 6 twelfths; the cœca 7 inches long, nearly cylindrical, 4 twelfths in diameter, a little narrower at the commencement.

Scaup Duck

1 Male. 2. Female.

Drawn from Nature by J.J Audubon, F.R.S.F.L.S.

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THE SCAUP DUCK.—FLOCKING FOWL.

FULIGULA MARILA, *Linn.*

PLATE CCCXCVII.—MALE AND FEMALE.

The opinion, derived from WILSON'S account of the Scaup Duck, that it is met with only along our sea coasts, in bays, or in the mouths of rivers, as far as the tide extends, is incorrect. Had WILSON resided in the Western Country, or seen our large lakes and broad rivers during late autumn, winter, or early spring, he would have had ample opportunities of observing thousands of this species, on the Ohio, the Missouri, and the Mississippi, from Pittsburg to New Orleans. I have shot a good number of Scaup Ducks on all these rivers, where I have observed them to arrive early in October, and whence they depart between the 1st of March and the middle of April. I have not, however, seen any in small creeks, lagoons, or ponds. When they arrive on the western waters, they are seen in flocks of from fifteen to twenty individuals; but in a few weeks these flocks are joined by others, for which reason the species is named in Kentucky the "Flocking Fowl." They are, however, seldom seen close together while on the water, and they rarely associate with other birds.

The Scaup Duck seems to float less lightly than it really does, its body being comparatively flat. It moves fast, frequently sipping the water, as if to ascertain whether its favourite food be in it. Then turning its head and glancing on either side to assure itself of security, down it dives with all the agility of a Merganser, and remains a considerable time below. On emerging, it shakes its head, raises the hind part of its body, opens its short and rather curved wings, after a few flaps replaces them, and again dives in search of food. Should any person appear when it emerges, it swims off to a considerable distance, watches every movement of the intruder, and finally either returns to its former place, or flies away.

These birds are fond of large eddies below projecting points of land, but frequently dive in search of food at a considerable distance from them. When in eddies they may be approached and shot with less difficulty than when in any other situation. If wounded only, they are not easily secured; in fact, you need not go after them, for by diving, fluttering along the surface, and cutting backward and forward, they generally elude pursuit. Be-

tween Louisville and Shippingport, on the Kentucky side of the Ohio, the shores are from ten to fifteen feet high, and rather abrupt when the waters are at their ordinary level. The Scaup Ducks are fond of diving for food along this place, and there, by coming directly upon them unseen, till you are almost over them, you may have the very best opportunities of procuring them. They are not worth shooting, however, unless for sport or examination, for their flesh is generally tough and rather fishy in flavour. Indeed I know none, excepting what is called *an Epicure*, who could relish a Scaup Duck.

They appear to experience some difficulty in getting on wing, and assist themselves on all occasions, either by meeting the current or fronting the wind, while they also use their broad feet as helps. When danger is near, they frequently, however, prefer diving, which they find as effectual a means of security as flying. As they usually feed at some distance from each other, it is amusing to see them go off, as they emerge from the water in succession, and to watch them when they collect again, and when, after flying for a long time in circles, now high then low over the water, they all re-light. These habits, and the toughness of their sinewy bodies, render it rather difficult to shoot them. Although flat-billed, they dive to a considerable depth, and when they have reached the bottom, no doubt furrow the mud, in the manner of the Shoveller (*Anas clypeata*), although the latter performs this action while floating on the surface, with its head and neck alone submersed, as it swims over the shallows.

The food of the Scaup Duck I have found to consist of small fry, crayfishes, and a mixture of such grasses as here and there grow along the beds of our rivers. I never found any portions of testaceous mollusca in the gizzards of those obtained on our western waters, although even there they might meet with abundance of these animals.

When these birds are travelling, their flight is steady, rather laborious, but greatly protracted. The whistling of their wings is heard at a considerable distance when they are passing over head. At this time they usually move in a broad front, sometimes in a continuous line. When disturbed, they fly straight forward for awhile, with less velocity than when travelling, and, if within proper distance, are easily shot. At times their notes are shrill, but at others hoarse and guttural. They are, however, rarely heard during the day, and indeed, like many other species, these birds are partly nocturnal.

At the approach of spring the Drakes pay their addresses to the females, before they set out on their journey. At that period the males become more active and lively, bowing their heads, opening their broad bills, and uttering a kind of quack, which to the listener seems produced by wind in their stomach, but notwithstanding appears to delight their chosen females.

The Scaup Duck varies materially as to size at different ages. Some wounded individuals which I kept, and which were birds of the first year, were much larger and heavier at the end of a year; and I agree with my learned friend NUTTALL, that specimens may be procured measuring from sixteen and a half to eighteen, nineteen, or twenty inches in length.

On the Atlantic coast I have met with this species from the Gulf of Mexico to the Bay of Fundy, and my friend THOMAS MACCULLOCH has told me that they are not unfrequent at Pictou in Nova Scotia. Farther north I saw none; and their breeding places are yet unknown to me.

SCAUP DUCK, *Anas Marila*, Wils. Amer. Orn., vol. viii. p. 84.
FULIGULA MARILA, *Scaup Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 456.
SCAUP DUCK, Nutt. Man., vol. ii. p. 437.
SCAUP DUCK, *Fuligula Marila*, Aud. Orn. Biog., vol. iii. p. 226: vol. v. p 614.

Male, 16½, 29. Female, 16½, 28.

Abundant during autumn on the Ohio and its tributaries, as well as those of the Missouri and the Mississippi. Rather common also along the Middle Atlantic Districts. Breeds far north.

Adult Male.

Bill as long as the head, deeper than broad at the base, enlarged and flattened towards the end, which is rounded, the frontal angles narrow and pointed. Upper mandible with the dorsal line at first straight and declinate, then slightly concave, along the unguis curved, the ridge broad at the base, narrowed at the middle, enlarged and convex towards the end, the sides nearly erect at the base, becoming more and more declinate and convex, the edges curved upwards, with about forty lamellæ, the unguis small and oblong. Nostrils sub-medial, oblong, rather large, pervious, near the ridge, in an oblong groove with a soft membrane. Lower mandible flat, with the angle very long and rather narrow, the dorsal line very short and straight, the erect edges with about sixty lamellæ,—on the upper edge, however, the lamellæ are more numerous,—the unguis broadly elliptical.

Head of moderate size. Eyes small. Neck of moderate length, rather thick. Body comparatively short, compact, and depressed. Wings small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly with a series of broad scutella, externally of which is another of smaller, the rest reticulated with angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, united by reticulated membranes having a sinus at their free margins, the outer and inner with loose somewhat lobed marginal membranes, all obliquely scutellate above, the third and fourth about equal and longest. Claws

small, that of first toe very small and curved, of middle toe largest, with an inner thin edge, of the rest very slender and pointed.

Plumage dense, soft, blended. Feathers of the head and neck short and velvety, those of the hind head a little elongated. Wings shortish, narrow, pointed; primary quills curved, strong, tapering, the first longest, the second very little shorter, the rest rapidly graduated; secondary broad and rounded, the inner elongated and tapering. Tail very short, much rounded, of fourteen feathers.

Bill light greyish-blue, the unguis blackish. Iris yellow. Feet greyish-blue, the webs and claws black. The head, the whole neck, and the fore part of the back and breast black, the head and neck glossed with purple and green, the rest tinged with brown. Hind part of the back, rump, abdomen, and upper and lower tail-coverts, brownish-black. Middle of the back, scapulars, inner secondaries, interior part of abdomen, and sides greyish-white, beautifully marked with undulating black lines. Middle of the breast white, wings light brownish-grey. Alula, primaries at the base and end, and the greater part of secondaries, brownish-black; the speculum on the latter white.

Length to end of tail 16¼ inches, to end of claws 18; extent of wings 29; wing from flexure 8¼; tail 2¼; bill along the back 1 $\frac{8}{12}$, along the edge of lower mandible 2; tarsus 1¼; middle toe 2 $\frac{2}{12}$, its claw $\frac{3}{12}$. Weight 1 lb. 6 oz.

Adult Female.

The female agrees with the male in the characters of the plumage, and in the colours of the bare parts; but those of the former differ considerably. The head, neck, and fore part of the back and breast, are umber brown; and there is a broad patch of white along the fore part of the forehead. The upper parts in general are brownish-black, the middle of the back and the scapulars undulated with whitish dots and bars. The primary quills are greyish in the middle, and the speculum is white, but of less extent than in the male. The greater part of the breast and abdomen is white; the sides and parts under the tail umber brown.

Length 16½ inches, extent of wings 28. Weight 1 lb. 6 oz.

Male. Breadth of mouth 8 twelfths; its roof broadly concave, with a median prominent line, on which are four papillæ, and at the anterior part two very short prominent lines; on the upper mandible on each side are 42 lamellæ, not projecting beyond the margin, and about 90 on the lower mandible. Tongue 1 inch 8 twelfths long, fleshy, with a deep groove above, a thin-edged series of lamellæ on each side, the tip somewhat semicircular and thin-edged. Œsophagus 8 inches long, its width from 5 twelfths to 4 twelfths, at the lower part of the neck enlarged to 6 twelfths, on entering

Ring-necked Duck.

1. Male. 2. Female.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S.

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the thorax contracted to 3 twelfths; the proventriculus oblong, 10 twelfths in breadth. The stomach is a very muscular gizzard, of a transversely elliptical form, placed obliquely, 1 inch 8 twelfths long, 2 inches 3 twelfths broad; the right muscle 10 twelfths thick; the left 9 twelfths; the grinding surfaces of the epithelium longitudinally rugous, and of a brownish-red colour. Lobes of the liver 1½ inches and 1 inch 1 twelfth long; gall-bladder oblong, 1 inch long by 4 twelfths. The intestine makes 16 turns; its length is 4 feet 7 inches, its width 4 twelfths; duodenal fold 3 inches; cœca 4 inches 9 twelfths long, only 1½ twelfths in breadth, narrower at the base and at the extremity; rectum 3 inches 9 twelfths long, 3½ twelfths wide.

Trachea 6¼ inches long, a little flattened, carinate behind at the upper part, from 5¼ twelfths to 3¼ twelfths in breadth; its rings moderately firm, unless at the back part, where they are cartilaginous; 108 in number, with about 8 more incorporated with the tympanum, which is very large, of an irregular form, its projection on the right side having a semicircular carina, and a great portion of it being membranous; its breadth 1 inch, its greatest height 1 inch 2 twelfths. Bronchi short, one of 25 half rings, the other of 30. Muscles as usual in this family.

THE RING-NECKED DUCK.

FULIGULA RUFITORQUES, *Bonap.*

PLATE CCCXCVIII.—MALE AND FEMALE.

The Ring-necked Duck is abundant on all our western waters during autumn and winter. It is also met with along our Atlantic coasts; but there, although I have seen many individuals on the Chesapeake and other large arms of the sea, it is by no means so plentiful as in the interior. Its flesh is excellent, equalling in my opinion that of any other Duck; and when it has been feeding along the margins of rivers, creeks, or ponds, for a few weeks it becomes very fat, tender, and juicy, and has none of the fishy flavour of those species which are in the habit of diving deep for their food. In shape, the Tufted Duck, or Ring-bill, as it is called in Kentucky, resembles the Scaup or Flocking Fowl, but is plumper and more rounded.

This bird arrives in Kentucky and the neighbouring States, as far down the Mississippi as New Orleans, from the 20th of September to the middle of October, at which latter period it may be found in the whole extent of the Union, from Massachusetts to Louisiana, being more numerous in some districts than in others, according to the suitableness of the place. They commonly move while on wing in flocks of from fifteen to twenty individuals, keeping rather scattered, and thus rarely affording what is called a good shot. They fly with rapidity, keeping at a considerable height, and the motion of their wings produces a constant whistling as they pass over head. Before alighting, they wheel and perform various evolutions, although they do not occupy so much time with them as Teals are wont to do.

They swim rather lightly and with ease, and, unlike the Scaups, experience no difficulty in rising on wing, whether from the land or from the water, but generally spring up at once, especially if alarmed. They have an almost constant practice of raising the head in a curved manner, partially erecting the occipital feathers, and emitting a note resembling the sound produced by a person blowing through a tube. At the approach of spring the males are observed repeating this action every now and then, while near the females, none of which seem to pay the least attention to their civilities.

Whilst in ponds, they feed by diving and dabbling with their bills in the mud amongst the roots of grasses, of which they eat the seeds also, as well as snails and all kinds of aquatic insects. When on rivers, their usual food consists of small fish and crays, the latter of which they procure at the bottom. A male which I shot near Louisville, in the beginning of May, exhibited a protuberance of the neck so very remarkable as to induce me to cut the skin, when I found a frog, the body of which was nearly two inches long, and which had almost choked the bird, as it allowed me to go up within a dozen or fifteen paces before I took aim. This species remains with us in the Western country later than most others of its tribe, and not unfrequently as late as the Blue-winged Teal.

We are indebted for the discovery of this species to my friend the Prince of MUSIGNANO, who first pointed out the difference between it and the Tufted Duck of Europe. The distinctions that exist in the two species he ascertained about the time of my first acquaintance with him at Philadelphia in 1824, when he was much pleased on seeing my drawing of a male and a female, which I had made in Louisville, in Kentucky, previous to WILSON'S visit to me there. WILSON supposed it identical with the European species.

The summer haunts and habits of this Duck have not been ascertained; for although Dr. RICHARDSON mentions that he found it not rare in the Fur Countries, he says nothing of its eggs or nest. While with us it has no long

crest, but I am inclined to think that at the commencement of the breeding season that appendage may be developed.

FULIGULA RUFITORQUES, Bonap. Syn., p. 393.
TUFTED DUCK, *Anas Fuligula*, Wils. Amer. Orn., vol. viii. p. 60.
RING-NECKED DUCK, *Anas (Fuligula) rufitorques*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 453.
RING-NECKED DUCK, *Fuligula rufitorques*, Nutt. Man., vol. ii. p. 439.
RING-NECKED DUCK, *Fuligula rufitorques*, Aud. Orn. Biog., vol. iii. p. 259.

Male, 18, 28. Female, 16.

Abundant on the Ohio during autumn, winter, and early spring; rather rare along the coasts of the Middle Atlantic Districts. Breeds far north.

Adult Male.

Bill about the same length as the head, rather deeper than broad at the base, depressed and enlarged towards the end, the frontal angles acute. Upper mandible with the dorsal line at first sloping, then concave, along the unguis decurved, the ridge broad and flat at the base, then broadly convex, the sides nearly flat and perpendicular at the base, convex and sloping towards the end, the edges soft, with about forty-five internal lamellæ, unguis obovate, curved. Nostrils sub-basal, lateral, rather small, oval, pervious. Lower mandible flat, with the angle very long and rather narrow, the dorsal line very short, slightly convex, the edges with about sixty-five lamellæ and smaller intermediate ones above.

Head of moderate size, neck rather long and slender, body full and depressed, wings rather small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, at its lower part anteriorly with two series of scutella, the rest covered with reticulated angular scales. Toes scutellate above, first very small, free, with a broad membrane beneath, fourth longest, third scarcely shorter; claws small, curved, compressed, obtuse, the hind one smaller, more curved and acute, that of the third toe with an inner sharp edge.

Plumage dense, soft, blended, rather glossy. Feathers of the middle of the head, and upper part of hind neck, very narrow and a little elongated; of the rest of the head and upper part of the neck very short, of the back and lower parts in general broad and rounded. Wings of moderate length, narrow, acute; primaries curved, strong, tapering, first longest, second very little shorter; secondaries broad, rounded, short, the inner long and tapering. Tail very short, rather broad, much rounded, of sixteen rounded feathers.

Bill black, with a basal band, the edges of both mandibles, and a band across the upper towards the end, pale blue. Iris yellow. Legs greyish blue, the webs brownish-black. The head, and upper part of the neck,

greenish-black, with purple reflections. A brownish-red collar, broader before, on the middle of the neck. Its lower part all round, as well as the back, scapulars, smaller wing-coverts, and posterior part of abdomen, brownish-black. Inner secondaries of the same colour, outer bluish-grey on the outer web, light brown on the inner, as are the primaries, of which the outer webs and tips are dark brown. Tail brownish-grey. Chin white, breast greyish-white, sides and fore part of abdomen greyish-white, minutely undulated with greyish-brown.

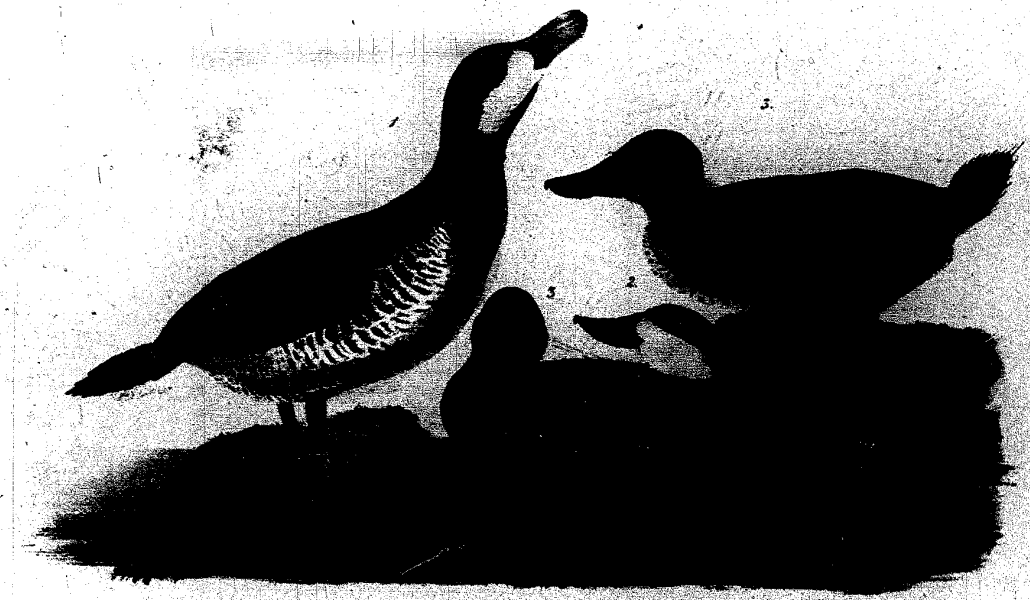
Length to end of tail 18 inches, to end of wings 16; extent of wings 28; wing from flexure $7\frac{3}{4}$; tail $2\frac{1}{2}$; bill along the back $2\frac{1}{16}$, along the edge of lower mandible $1\frac{11}{12}$; tarsus $1\frac{4}{12}$; middle toe $2\frac{2}{12}$, its claw $\frac{4}{12}$.

Adult Female.

The female has the neck umber-brown, the upper part of the head darker, the back blackish-brown, the speculum bluish-grey, as in the male, the breast brownish-white, the loral spaces and chin pale brown, the abdomen umber-brown.

Length 16 inches.

The Tufted Duck of Europe, *Fuligula cristata*, is very intimately allied to this species. The bill of the latter is longer, narrower, and differently coloured, the unguis broader at the end, as is the flat triangular space at the base of the upper mandible. The bill of the Scaup Duck is still broader towards the end, with a much narrower unguis, and the flattened part of the upper mandible still narrower than in the Tufted Duck; the colour of the speculum is also different, being bluish-grey in the Ring-necked Duck, and white in the two allied species. The females of the Ring-necked and Scaup Ducks, which are nearly similar in colour, differ in the speculum, and in the peculiar form of the bill.



Ruddy Duck.

1. Male 2. Female 3. Young.

Drawn from Nature by J.J.Audubon F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T.Bowen Phila.a

RUDDY DUCK.

FULIGULA RUBIDA, *Wilsu*,

PLATE CCCXCIX.—MALE, FEMALE, AND YOUNG.

Look at this plate, reader, and tell me whether you ever saw a greater difference between young and old, or between male and female, than is apparent here. You see a fine old male in the livery of the breeding season, put on as it were expressly for the purpose of pleasing the female for awhile. The female has never been figured before; nor, I believe, has any representation been given of the young in the autumnal plumage. Besides these, you have here the young male at the approach of spring.

The Ruddy Duck is by no means a rare species in the United States; indeed I consider it quite abundant, especially during the winter months in the Peninsula of Florida, where I have shot upwards of forty in one morning. In our Eastern Districts they make their appearance early in September, and are then plentiful from Eastport to Boston, in the markets of which, as well as of New York, I have seen them. On the Ohio and Mississippi they arrive about the same period; and I have no doubt that they will be found breeding in all our Western Territories, as soon as attention is paid to such matters as the searching for nests with the view of promoting science, or of domesticating birds which might prove advantageous to the husbandman.

My friend Dr. BACHMAN informs me that this species is becoming more abundant every winter in South Carolina. In the month of February he has seen a space of the extent of an acre covered with it. Yet he has never found one in full summer plumage in that country. It is equally fond of salt or brackish and of fresh waters; and thus we find it at times on our sea-coasts, bays, and mouths of rivers, as well as on lakes and even small ponds in the interior, or on our salt marshes, provided they are not surrounded by trees, as it cannot rise high in the air unless in an open space of considerable extent. At the time of their arrival, they are seen in small flocks, more than from seven to ten being seldom found together, until they reach the Southern States, where they congregate in great flocks. When they leave their northern breeding-grounds some proceed along the coast, but a greater number along our numerous rivers.

The flight of the Ruddy Duck is rapid, with a whirring sound, occasioned

by the concave form of the wings and their somewhat broad ends, the whistling sound produced by other species having more pointed and stiffer quills, not being heard in this, or only in a very slight degree. They rise from the water with considerable difficulty, being obliged to assist themselves with their broad webbed feet, and to run as it were on the surface for several yards, always against the breeze, when it blows smartly. The strength of the muscles of their feet enables them to spring from the ground at once. When they are fairly on wing, they fly in the same manner as most of our travelling Ducks, sustain themselves with ease, and are apt to remove to great distances. They alight on the water more heavily than most others that are not equally flattened and short in the body; but they move on that element with ease and grace, swimming deeply immersed, and procuring their food altogether by diving, at which they are extremely expert. They are generally disposed to keep under the lee of shores on all occasions. When swimming without suspicion of danger, they carry the tail elevated almost perpendicularly, and float lightly on the water; but as soon as they are alarmed, they immediately sink deeper, in the manner of the Anhinga, Grebes, and Cormorants, sometimes going out of sight without leaving a ripple on the water. On small ponds they often dive and conceal themselves among the grass along the shore, rather than attempt to escape by flying, to accomplish which with certainty they would require a large open space. I saw this very often when on the plantation of General HERNANDEZ in East Florida. If wounded, they dived and hid in the grass; but, as the ponds there were shallow, and had the bottom rather firm, I often waded out and pursued them. Then it was that I saw the curious manner in which they used their tail when swimming, employing it now as a rudder, and again with a vertical motion; the wings being also slightly opened, and brought into action as well as the feet. They are by no means shy, for I have often waded toward them with my gun until very near them, when I cared not about shooting them, but was on the look-out for a new Rail or Gallinule, along the margin of the ponds. They are often seen in company with Teals, Scaup Ducks, Gadwalls, Shovellers, and Mallards, with all of which they seem to agree.

My opinion that the males of this species lose the brightness of their spring dress before they return to us in autumn, is founded on the occurrence of multitudes of males at that season destitute of the garb in question, and my examination of many for the purpose of determining their sex and ascertaining that they were old birds. In February, 1832, I saw immense flocks of Ruddy Ducks about a hundred miles up the St. John's in Florida. They would start from the water, as our schooner advanced under sail, patting it with their feet, so as to make a curious and rather loud noise, somewhat

resembling the fall of hail-stones on the shingles. Their notes are uttered in a rather low tone, and very closely resemble those of the Female Mallard. They afford good eating when fat and young, and especially when they have been feeding for some weeks on fresh waters, where their food generally consists of the roots and blades of such grasses as spring from the bottom of rivers and ponds, as well as of the seeds of many gramineæ. When on salt marshes, they eat small univalve shells, fiddlers, and young crabs, and on the sea-coast, they devour fry of various sorts. Along with their food, they swallow great quantities of sand or gravel.

At St. Augustine, in Florida, I shot a young bird of this species immediately under the walls of the fort. Although wounded severely and with one of its legs broken close to the body, it dived at once. My Newfoundland dog leaped into the water, and on reaching the spot where the bird had disappeared, dived also, and in a few moments came up with the poor thing in his mouth. When the dog approached I observed that the Duck had seized his nose with its bill; and when I laid hold of it, it tried to bite me also. I have found this species hard to kill, and when wounded very tenacious of life, swimming and diving at times to the last gasp.

In the Fauna Boreali-Americana, the tail of the Ruddy Duck is said to be composed of sixteen feathers, and in NUTTALL'S Manual of twenty; but the number is eighteen.

RUDDY DUCK, *Anas rubida*, Wils. Amer. Orn., vol. viii. p. 137.
FULIGULA RUBIDA, Bonap. Syn., p. 390.
FULIGULA RUBIDA, *Ruddy Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 455.
RUDDY DUCK, Nutt. Man., vol. ii. p. 426.
RUDDY DUCK, *Fuligula rubida*, Aud. Orn. Biog., vol. iv. p. 326.

Male, 14¾, 21½.

Adult Male in summer.

Bill as long as the head, a little higher than broad at the base, depressed and widened toward the end, which is rounded. Dorsal outline straight and declinate to the nostrils, then direct and slightly concave, the sides sloping and concave at the base, broadly convex toward the end, the edges soft, with about forty short erect lamellæ internally on each side, the unguis linear-oblong, suddenly decurved and directed backwards, its lower part transversely expanded and serrulate. Nostrils in an oblong depression covered with skin, medial, rather small, linear-oblong, pervious. Lower mandible flattened, a little recurved, its angle very long, narrow, the laminæ about a hundred and forty and extremely small, the unguis oblong.

Head rather large, oblong. Eyes of moderate size. Neck short and thick. Body full, much depressed. Legs short and placed rather far

behind; tibia bare for a short space; tarsus very short, compressed, with an anterior series of small scutella, an outer short series going to the fourth toe, the rest reticulated. Hind toe very small, with a free inferior web; anterior toes very long, slender, the middle toe double the length of the tarsus, the outer almost as long, the inner considerably shorter, and having a broad lobed margin; the webs reticulated. Claws rather small, slender, compressed, slightly arched, acute.

Plumage dense, blended, on the upper parts very soft; on the fore part of the head stiffish; on the lower parts with a silky gloss, and stiff, having the extremities broad, and the barbs strong and pointed. Wings very short, of moderate breadth, concave, pointed; primaries tapering, the first longest, obliquely rounded. Tail short, much graduated, of *eighteen* stiff, narrow feathers, of which the shaft is very strong, and runs out in a flattened concave point.

Bill and edges of eyelids greyish-blue. Iris hazel. Feet dull greyish-blue; webs inclining to dusky; claws greyish-brown. Upper part of the head and nape deep bluish-black, that colour running to a point about the middle of the neck; a large white patch on each side of the head, from the bill to behind the ear, narrowed on the throat. Neck all round, and all the upper parts, as well as the sides of the rump, rich glossy brownish-red or chestnut; the lower parts greyish-white, tinged with brown, and marked with transverse interrupted bands of dusky. Wing-coverts, quills, and tail-feathers, blackish-brown.

Length to end of tail 14¾ inches, to end of wings 12½, to end of claws 15, to carpal joint 7¼; extent of wings 21½; wing from flexure 6¼; tail 3½; bill along the ridge 1⅝, along the edge of lower mandible 1⅝; tarsus 1¼; hind toe and claw ⅝; inner toe 1¼, its claw ¼; middle toe 2⅛, its claw ⅜; outer toe 2⅛, its claw ¼. Weight 1¼ lbs. Average measurements of six individuals.

The black on the head of the male is sometimes marked with a few white feathers.

Adult Female in summer.

The plumage presents the same characters as in the male. The bill is of a darker greyish-blue; iris as in the male; feet darker. The top of the head, and all the upper parts, are dark reddish-brown, minutely dotted and undulated with dusky; wings and tail as in the male; lower parts duller than in the male, but similarly marked; the throat, and a band from the base of the upper mandible to beneath the eye, brownish-white.

Male one year old.

Bill, eyes, and feet as in the adult. A similar white patch on the side of the head; upper part of head and hind neck dull blackish-brown; throat and

sides of the neck greyish-brown, lower part of neck dull reddish-brown, waved with dusky; upper parts as in the adult, but of a duller tint; lower parts greyish-white.

Young in December.

Bill dusky; iris hazel; feet yellowish-green, webs dusky. All the upper parts dull reddish-brown, tinged with grey, and barred with dusky; wings and tail dark greyish-brown. Cheeks, fore part and sides of neck, and all the lower parts, dull yellowish-white, undulated with dusky; as is the rump above; the lower tail-coverts white.

The tongue of a male is 1 inch 8 twelfths long, and of the same general form as that of the Fuligulæ, but a little more dilated at the end. The œsophagus is ½ inch in diameter until its entrance into the thorax, when it contracts, and again expands to 6 twelfths, to form the proventriculus, of which the glandules are oblong, small, and very numerous, occupying a space of 2¼ inches in length. The stomach is a strong gizzard, of a roundish form, 1 inch 5 twelfths long, 1½ inches broad; its lateral muscles very large, and about 8 twelfths thick; the epithelium confined to two round spaces ½ inch in diameter, opposite the lateral muscles. The intestine is 5 feet 1½ inches long, its diameter varying from 5 twelfths to 3½ twelfths. The rectum is 2 inches 10 twelfths long; the cœca 4 inches 2 twelfths, their greatest diameter 2½ twelfths.

In another male, the œsophagus is 7½ inches long; the stomach 1 inch 5 twelfths long, 1 inch 6 twelfths broad; the intestine 5 feet 11 inches long; the rectum 2⅝ inches; the cœca 4⅛ inches, their greatest diameter 2½ twelfths.

The trachea is 5¾ inches long. The thyroid bone is comparatively large, forming an expansion 7 twelfths long, 5 twelfths broad. At its upper part the trachea has a diameter of 3 twelfths, about the middle enlarges to 4 twelfths, and so continues nearly to the end, when it contracts to 2 twelfths. The last ring is very large, being formed of five or six united rings, of which the last two or three are split; but there is no expansion or tympanum as in other Ducks. The muscles are as in the other species of this family. The bronchi are of moderate length, with about 15 half rings.

PIED DUCK.

FULIGULA LABRADORA, *Lath.*

PLATE CCCC.—MALE AND FEMALE.

Although no birds of this species occurred to me when I was in Labrador, my son, JOHN WOODHOUSE, and the young friends who accompanied him on the 28th of July, 1833, to Blanc Sablon, found, placed on the top of the low tangled fir-bushes, several deserted nests, which, from the report of the English clerk of the fishing establishment there, we learned to belong to the Pied Duck. They had much the appearance of those of the Eider Duck, being very large, formed externally of fir twigs, internally of dried grass, and lined with down. It would thus seem that the Pied Duck breeds earlier than most of its tribe. It is surprising that this species is not mentioned by Dr. RICHARDSON in the Fauna Boreali-Americana, as it is a very hardy bird, and is met with along the coasts of Nova Scotia, Maine, and Massachusetts, during the most severe cold of winter. My friend Professor MACCULLOCH of Pictou, has procured several in his immediate neighbourhood; and the Honourable DANIEL WEBSTER of Boston sent me a fine pair killed by himself, on the Vineyard Islands, on the coast of Massachusetts, from which I made the drawing for the plate before you. The female has not, I believe, been hitherto figured; yet the one represented was not an old bird.

The range of this species along our shores does not extend farther southward than Chesapeake Bay, where I have seen some near the influx of the St. James river. I have also met with several in the Baltimore market. Along the coast of New Jersey and Long Island it occurs in greater or less number every year. It also at times enters the Delaware river, and ascends that stream at least as far as Philadelphia. A bird-stuffer whom I knew at Camden had many fine specimens, all of which he had procured by baiting fish-hooks with the common mussel, on a "trot-line" sunk a few feet beneath the surface, but on which he never found one alive, on account of the manner in which these Ducks dive and flounder when securely hooked. All the specimens which I saw with this person, male and female, were in perfect plumage; and I have not enjoyed opportunities of seeing the changes which this species undergoes.

The Pied Duck seems to be a truly marine bird, seldom entering rivers


N° 80.
Pl. 400
Pied Duck
Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.
1. Male. 2. Female.
Lith. Printed & Col.d by J. T. Bowen. Philad.a

unless urged by stress of weather. It procures its food by diving amidst the rolling surf over sand or mud bars; although at times it comes along the shore, and searches in the manner of the Spoonbill Duck. Its usual fare consists of small shell-fish, fry, and various kinds of sea-weeds, along with which it swallows much sand and gravel. Its flight is swift, and its wings emit a whistling sound. It is usually seen in flocks of from seven to ten, probably the members of one family.

PIED DUCK, *Anas labradora*, Wils. Amer. Orn., vol. viii. p. 91.
FULIGULA LABRADORA, Bonap. Syn., p. 391.
PIED DUCK, Nutt. Man., vol. ii. p. 428.
PIED DUCK, *Fuligula labradora*, Aud. Orn. Biog., vol. iv. p. 271.

Male, 20, 30. Female, 18¼, 29.

Along the shores of the Atlantic from Nova Scotia to New Jersey, rather rare, in winter. Breeds from Labrador northward. Never seen in the interior.

Adult Male.

Bill nearly as long as the head, rather broader than high at the base, the sides nearly parallel, but at the end enlarged by soft membranous expansions to the upper mandible. The latter has the dorsal outline at first straight and declinate, then direct and slightly convex, at the extremity decurved; the ridge broad at the base, convex toward the end; the sides sloping at the base, then convex, the extremity broad and rounded, the unguis broadly obovate; the margins soft, expanded toward the end, and with about 50 lamellæ, of which the anterior are inconspicuous. Nasal groove oblong, nostrils linear-oblong, sub-basal near the ridge. Lower mandible flattened, curved upwards, with the angle very long and narrow, the dorsal line very short, and nearly straight, the nearly erect edges with about 30 large and prominent lamellæ; the unguis very broad.

Head of moderate size, oblong, compressed. Eyes small. Neck rather short and thick. Body full, depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, with two anterior series of rather small scutella, the sides and back part reticulated with angular scales. Hind toe very small, with a free membrane beneath; outer anterior toes double the length of the tarsus, and nearly equal, the inner much shorter, and with a broad marginal membrane. Claws small, slightly arched, compressed, rather acute.

Plumage dense, soft, blended; feathers of the head and neck small, oblong; toes on the lower part of the cheeks very stiff, having the terminal filaments more or less united into a horny plate. Wings short, of moderate breadth, concave, acute; primary quills curved, strong, tapering, the second

very slightly longer than the first, the rest rapidly graduated; secondary quills broad and rounded, the inner elongated and tapering. Tail very short, much rounded, of fourteen tapering feathers.

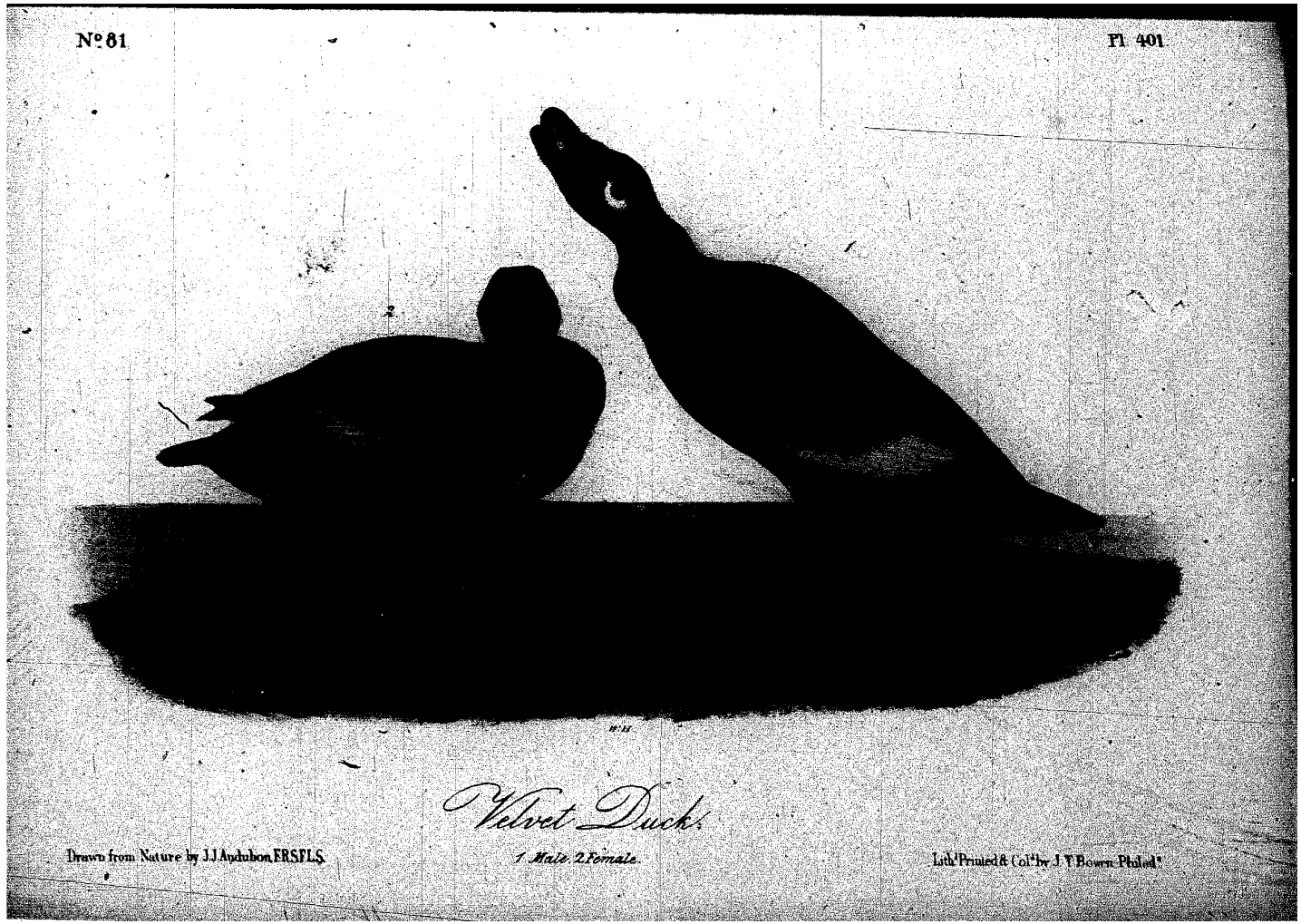
Bill with the basal space between the nostrils running into a rounded point in the middle, pale greyish-blue; the sides of the base, and the edges of both mandibles for two-thirds of their length, dull pale orange; the rest of the bill black. Iris reddish-hazel. Feet light greyish-blue, webs and claws dusky. Head and upper half of neck white, excepting an elongated black patch on the top of the head and nape. Below the middle of the neck is a black ring, from the hind part of which proceeds a longitudinal band of the same colour, gradually becoming wider on the back and rump; below the black ring anteriorly is a broad band of white, passing backwards on each side so as to include the scapulars. All the under parts black, excepting the axillaries and lower wing-coverts. Upper wing-coverts and secondary quills white, some of the inner quills with a narrow external black margin; alula, primary coverts, and primary quills, brownish-black. Tail brownish-black, tinged with grey, the shafts black; upper tail-coverts dusky, minutely dotted with reddish-brown.

Length to end of tail 20 inches, to end of claws 22½, to end of wings 18½; extent of wings 30; wing from flexure 9¼; tail 3⅝; bill along the ridge 1⅛, along the edge of lower mandible 2⅜; tarsus 1½; middle toe 2⅜, its claw ⅜; hind toe 4½, its claw ⅛; outer toe and claw slightly longer than middle; inner toe 1⅞, its claw ⅜. Weight 1 lb. 14½ oz.

Female.

The female is less than the male. The bill, iris, and feet are coloured as in the male; sides of the forehead white (not in the figure, it having been taken from a young bird). The general colour is brownish-grey, darker on the head, cheeks, back, rump, and abdomen, of a lighter tint, approaching to ash-grey, on the throat, breast, wing-coverts, and inner secondaries, which are margined externally with black; seven or eight of the secondary quills white; the primaries and tail-feathers as in the male.

Length to end of tail 18¼ inches, to end of claws 19⅜, to end of wings 17; extent of wings 29; wing from flexure 9; tail 3½; bill along the ridge 1⅝, along the edge of lower mandible 2⅛; tarsus 1½; hind toe and claw ⅝; middle toe and claw 2½. Weight 1 lb. 1 oz.


No. 81
Pl. 401
Velvet Duck.
Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.
1 Male 2 Female.
Lith.d Printed & Col.d by J.T.Bowen. Phila.a

THE VELVET DUCK.

FULIGULA FUSCA, *Linn.*

PLATE CCCCI.—MALE AND FEMALE.

The Velvet Duck arrives from the north along the shores of the Middle States about the first of September, and extends to a greater or less distance southward, according to the state of the weather, often proceeding as far as Georgia. The Bay of Chesapeake and all the estuaries to the eastward are amply furnished with it, and there it is usually seen in company with the American Scoter, the Golden-eyed Duck, and some other species. It very rarely enters fresh waters during its stay on our coast, and is with great propriety called a Sea Duck. My friend THOMAS NUTTALL mentions that some, which probably were young birds, had been seen in Fresh Pond near Cambridge in Massachusetts. This is the only case of the kind that I have heard of, although these birds breed in fresh water lakes and in rivers, in which they remain at the season of reproduction about two months.

In the beginning of April, the Velvet Ducks, which are gregarious, collect in large flocks, for the purpose of removing to their northern breeding places, and as they fly steadily onwards, you may see thousands passing at short distances from the shores, and forming an almost continuous line, each flock composed of twenty or thirty individuals, which fly low and irregularly, ranged in an angular form. While on the Bay of Fundy, I went with my party to a projecting cape, round which these birds passed during our stay, from daylight until evening. When it blows hard from the sea, the Ducks come near to the shore, and afford abundant opportunities to such sportsmen as are fond of shooting them.

As we approached the shores of Labrador, we found the waters covered with dense flocks of these birds, and yet they continued to arrive there from the St. Lawrence for several days in succession. We were all astonished at their numbers, which were such that we could not help imagining that all the Velvet Ducks in the world were passing before us. This was about the middle of June, which I thought late for them, but the season had been tardy, and the fishermen informed us, that when the weather is warmer, these birds pass a fortnight earlier. The greater number merely appear for a few days on their way farther north, but some remain to breed on the

southern coast of Labrador. Thousands of sterile individuals, however, spend the summer on the Bay of Fundy.

During the breeding season, the Velvet Duck resembles the Eider in its habits, only that it prefers fresh water, which is rarely the case with the other species. The males leave the females after incubation has commenced. Those which breed at Labrador begin to form heir nests from the 1st to the 10th of June, and on the 28th of July I caught some young ones several days old. The nests are placed within a few feet of the borders of small lakes, a mile or two distant from the sea, and usually under the low boughs of the bushes, of the twigs of which, with mosses and various plants matted together, they are formed. They are large and almost flat, several inches thick, with some feathers of the female, but no down, under the eggs, which are usually six in number, intermediate in size between those of the Eider and King Ducks, measuring an inch and three quarters in length, one and seven-eighths in breadth, of a uniform pale cream-colour, tinged with green, not pure white as stated by some authors. On the 28th of July I procured five young ones out of a brood of six, among which, although to appearance scarcely a week old, I could readily distinguish the males from the females as they swam on the little pond around their mother, the former having already a white spot under the eye. The down with which they were covered was rather stiff and hair-like, of a black colour, excepting under the chin, where there was a small patch of white. They swam with great ease, and when we drove them into a narrow place for the purpose of catching them, they several times turned upon us and dived with the view of getting back to the middle of the pond, so that at last we found it necessary to shoot them. Only one escaped ashore, which my young friend THOMAS LINCOLN caught, but afterwards restored to its mother, which continued on the pond, manifesting the greatest anxiety, and calling to her brood all the while with short squeaking notes, by no means unpleasant to the ear. On being shot at, she flew off to another pond, but soon returned. Her plumage was rusty and ragged, but the wings seemed to be complete, as she flew with great ease, springing at once from the water.

Mr. JONES of Bras d'Or assured me, that either that individual or another of the same species, had bred on the same pond for six or seven years in succession, and that he had looked at the nest and observed her manners when leading about the young, which he said did not leave the pond until they were able to fly. That year, 1833, she and her mate had arrived nearly a month later than usual. This accounted for the small size of the young, which he was sorry to see dead ; and here let me say that Mr. JONES, who is not only a good-hearted and benevolent man, but also fond of observing

nature, was the first person I met with who could give me any rational account of the Ducks which bred in his vicinity.

A few of the Velvet Ducks breed on the Island of Grand Manan, and in other places about the Bay of Fundy, but rarely farther south, and the number that remain in Labrador is comparatively small, as we did not observe there more than six or seven broods. They generally leave that part of the coast about the middle of August; but that season they were still seen after the Eider Ducks had departed, which makes me think that they require more warmth than these birds before they begin to lay their eggs. Captain JAMES CLARK ROSS, of the British Royal Navy, a gentleman, besides his professional merits, distinguished for his love of science, informed me that none of these birds were observed on either of his Arctic voyages. The extreme limits of their migrations remain unknown.

The flight of the Velvet Duck is strong and sustained, although it usually flies low; yet when pursued, or at the sight of gunners in a boat, it often rises to the height of forty or fifty yards, describes elegant curved lines as it passes and repasses, and thus continues to fly until danger is no longer apprehended. Its movements in the air are performed by continued flappings, and when on wing the white of the wings is beautifully contrasted with the dark hue of the rest of its plumage. It dives with as much agility as the Eider or American Scoter, and, when wounded, is equally difficult to be caught, nor can it be killed with certainty without a heavy shot.

The Velvet Ducks enter the bays and estuaries to a greater distance than the Eiders. On land they move with more difficulty than those birds, and keep themselves in a more erect attitude, like that in which I have endeavoured to represent the male in the plate. They swim with more buoyancy than the Eiders, but at times seem to rise from the water with considerable difficulty. Their food consists of shell-fish and crustacea, as well as sea-weeds, small fish, and spawn. Their flesh is extremely dark, tastes of fish, and is very unpalatable, although I have seen persons of great judgment in matters of this kind not only eat it with avidity, but praise it as highly as if it were equal to the most tender and juicy venison. They are sold in abundance in our eastern markets and those of the Middle States, at from fifty cents to a dollar the pair.

This species is, in my opinion, very closely allied to the Eider, insomuch that I frequently call it the Black King-Duck. Along our coasts it commonly receives the name of White-winged Coot. The female is smaller than the male. The young much resemble the female during the first year. The white spots of the head, however, are apparent, although mottled with dusky, and their feet now shew some of the redness of those of the old males; but I am unable to say with certainty at what age they attain their full summer

plumage, and the rich colouring of the bill. The *gizzard*, which is not so large as that of the Eider, is of a yellow colour; the gut very large, tough, and strong, about eight feet in length.

VELVET DUCK, *Anas fusca*, Wils. Amer. Orn., vol. viii. p. 137.
FULIGULA FUSCA, Bonap. Syn., p. 390.
OIDEMIA FUSCA, *Velvet Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 449.
VELVET DUCK, Nutt. Man., vol. ii. p. 419.
VELVET DUCK, *Fuligula fusca*, Aud. Orn. Biog., vol. iii. p. 354.

Male, 22, 39. Female, 22, 38.

From the coast of Georgia eastward to Nova Scotia, during winter, when it is extremely abundant in all the estuaries and bays. Breeds from Labrador northward.

Adult Male.

Bill about the length of the head, very broad, as deep as broad at the base, depressed and flattened towards the end, which is rounded. Upper mandible with a short abrupt prominence at the base, its dorsal line on the prominence straight, at its fore edge abruptly sloping, then slightly concave, and at the end curved, the ridge on the prominence very broad and nearly flat, towards the end broadly convex, the sides convex, the edges obtuse, with about thirty lamellæ, the unguis very large, and elliptical. Nostrils sub-basal, elliptical, very large, pervious, nearer the ridge than the edge, and placed on the lower side of the basal prominence. Lower mandible flat, with the angle long, rather narrow, rounded, the dorsal line slightly convex, the edges with about twenty-five lamellæ, the unguis nearly circular and very large.

Head large. Eyes rather small. Neck of moderate length, thick. Body large, and much depressed. Wings rather small. Feet very short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, united by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick edge, the third and fourth about equal and longest. Claws small, that of first toe very small and curved, of middle toe largest, with a dilated inner edge, of the rest slender, all obtuse.

Plumage dense, soft, blended. Feathers on the fore part of the head extremely small, on the neck velvety. Wings rather short, narrow, pointed; primary quills curved, strong, tapering and pointed, the first longest, the second very little shorter, the rest rapidly graduated; secondary broad and

rounded, the inner elongated and tapering. Tail very short, narrow, wedge-shaped, of fourteen stiff narrow feathers.

Basal prominence and sides of the bill black, the sides towards the end bright red, the unguis flesh-colour, with a black line on each side. Iris bright yellow. Feet carmine on the outer side, orange-red on the inner, the webs greyish-black. The general colour of the plumage is brownish-black, on the upper parts glossed with blue, lighter on the lower. The outer secondary quills are white, and there is a spot of the same under the eye.

Length to end of tail 22 inches, to end of wings 19½, to end of claws 24½; extent of wings 39; wing from flexure 12; tail 3½; bill $1\frac{8}{12}$, along the edge of lower mandible $2\frac{7}{12}$; tarsus 1¼; middle toe 3, its claw $\frac{5}{12}$. Weight 3 lbs. 10 oz.

Adult Male.

In the female the basal prominence of the bill is much less elevated, and the colour of the whole bill is dusky. The iris and feet are as in the male, but of duller tints. The general colour of the plumage is a sooty-brown, the breast and abdomen lighter. There are two whitish spots on each side of the head, one near the base of the upper mandible, the other behind the eye; the outer secondary quills are white, as in the male.

Length to end of tail 22 inches, to end of wings 18, to end of claws 25½; extent of wings 38; wing from flexure 11¼; tail 3½; bill $1\frac{7}{12}$, along the edge of lower mandible $2\frac{7}{12}$; tarsus 1⅝; middle toe $2\frac{1}{12}$, its claw $\frac{5}{12}$. Weight 3 lbs. 3 oz.

The down of this species is similar to that of the Eider Duck, and apparently of equal quality.

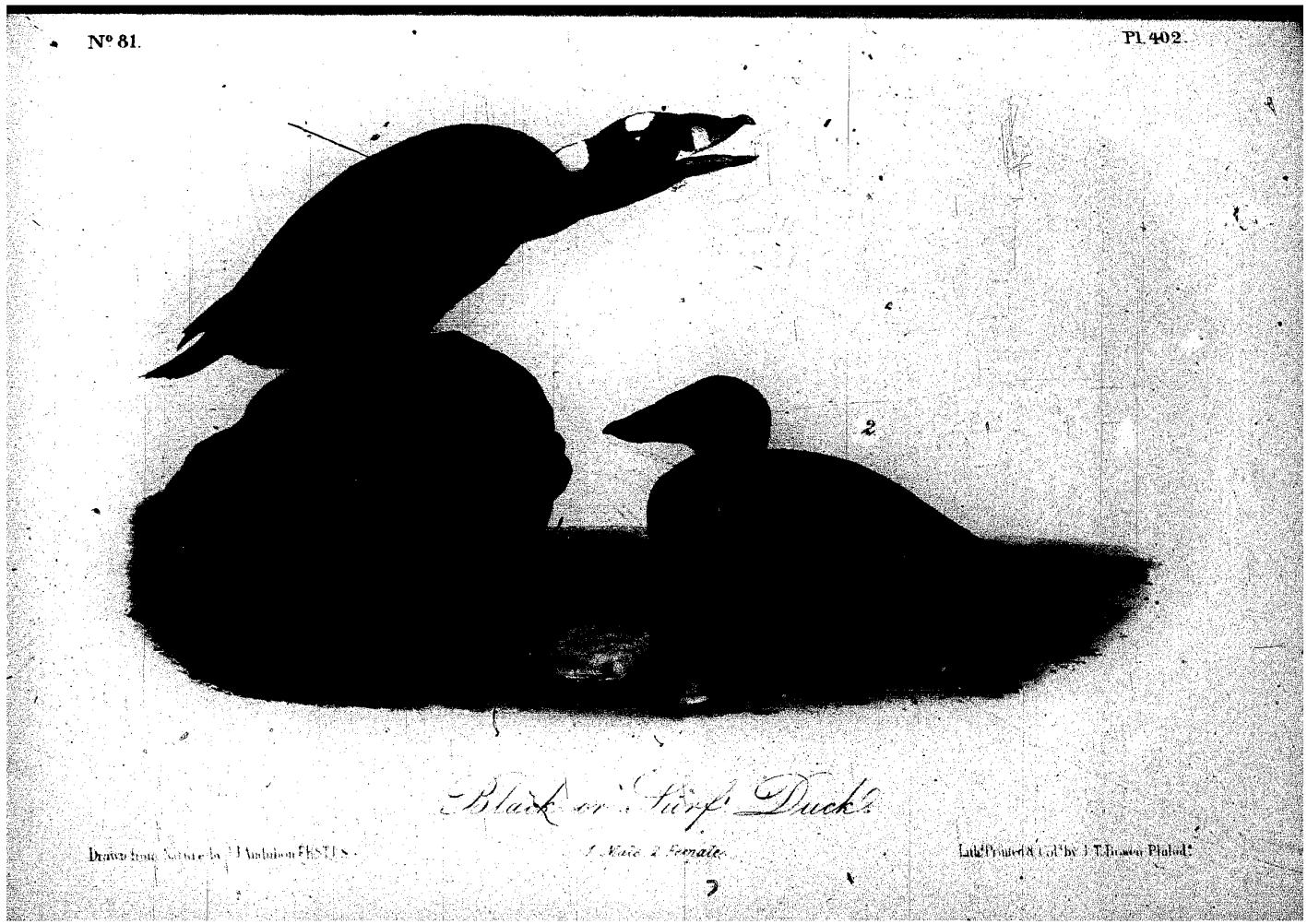
SURF DUCK.

FULIGULA PERSPICILLATA, *Linn.*

PLATE CCCCII.—MALE AND FEMALE.

Although several years have elapsed since I visited the sterile country of Labrador, I yet enjoy the remembrance of my rambles there; nay, reader, many times have I wished that you and I were in it once more, especially in the winter season. I calculate indeed how easily this wish might be accomplished, were I ten years younger. Under the hospitable roof of Mr. JONES, while the tempest might be hurling southward the drifting snows, I could live in peaceful content, cheered by the matchless hand-organ of my kind hostess. Then, how pleasant it would be in calm weather to traverse the snowy wastes, to trap the cunning fox and the Jer Falcon, allured by their favourite winter food, the Rock Grouse; with what delight should I gaze on the dim red sun creeping along the southern horizon, or watch the flittering beams of the northern aurora. Now, over the glittering snow, JONES's Esquimaux curs might swiftly convey us to his friends, here crossing the ice-bound gulf, there traversing fissures and crags impassable in summer. Then what long tales for the long nights, and sports for the short days. The broad-antlered Caribou might have scampered before me, but its bounds would have been suddenly checked by the fleeter ball of my well-directed rifle. The wolf might have prowled around us, until he had been captured in the deeply dug and well-baited pit. Then Nature's pure mantle would be seen slowly to disappear, the low grounds would be inundated with the snow-waters, the warm breezes would dry the mountain ridges, and with the first appearance of verdure joy would cause every heart to bound. Thousands of seals would be seen to snuff the milder air, myriads of tiny fishes would approach the shores, and millions of feathered wanderers would pass over on whistling pinions. But alas! I shall never spend a winter in Labrador.

While proceeding towards that country in 1823, on board the Ripley, I found the waters of the Gulf of St. Lawrence alive with Ducks of different species. The nearer we approached the coast, the more numerous did they become; and of the many kinds that presented themselves to our anxious gaze, the Surf Duck was certainly not the least numerous. It is true that in


N° 81.
Pl. 402.
2
Black or Sharp Tailed Ducks
1 Male 2 Female
Drawn from Nature by J. Audubon F.R.S.L.S.
Lith. Printed & Col.d by J. T. Bowen Philad.a

the noble bays of our own coast, in the Sound, between New York and the Hook, on the broader waters of the Chesapeake, and beyond them to the mouths of the Mississippi, I had seen thousands of Surf Ducks; but the numbers that passed the shores of Labrador, bound for the far north, exceeded all my previous conceptions.

For more than a week after we had anchored in the lovely harbour of Little Macatina, I had been anxiously searching for the nest of this species, but in vain: the millions that sped along the shores had no regard to my wishes. At length I found that a few pairs had remained in the neighbourhood, and one morning, while in the company of Captain EMERY, searching for the nests of the Red-breasted Merganser, over a vast oozy and treacherous fresh-water marsh, I suddenly started a female Surf Duck from her treasure. We were then about five miles distant from our harbour, from which our party had come in two boats, and fully five and a half miles from the waters of the Gulf of St. Lawrence. The marsh was about three miles in length, and so unsafe that more than once we both feared, as we were crossing it, that we might never reach its margin. The nest was snugly placed amid the tall leaves of a bunch of grass, and raised fully four inches above its roots. It was entirely composed of withered and rotted weeds, the former being circularly arranged over the latter, producing a well-rounded cavity, six inches in diameter, by two and a half in depth. The borders of this inner cup were lined with the down of the bird, in the same manner as the Eider Duck's nest, and in it lay five eggs, the smallest number I have ever found in any Duck's nest. They were two inches and two and a half eighths in length, by one inch and five-eighths in their greatest breadth; more equally rounded at both ends than usual; the shell perfectly smooth, and of a uniform pale yellowish or cream-colour. I took them on board, along with the female bird, which was shot as she rose from her nest. We saw no male bird near the spot; but in the course of the same day, met with several males by themselves, about four miles distant from the marsh, as we were returning to the harbour. This induced me to believe that, like the Eider and other Ducks that breed in Labrador, the males abandon the females as soon as incubation commences. I regret that, notwithstanding all my further exertions, I did not succeed in discovering more nests or young birds.

In the States of Maine and Massachusetts, this species is best known by the name of "Butter-boat-billed Coot." The gunners of Long Island and New Jersey call it the Black Sea Duck. It is often seen along the coast of South Carolina, where my friend JOHN BACHMAN has met with it. The Surf Duck is a powerful swimmer and an expert diver. It is frequently observed fishing at the depth of several fathoms, and it floats buoyantly

among the surf or the raging billows, where it seems as unconcerned as if it were on the most tranquil waters. It rises on wing, however, with considerable difficulty, and in this respect resembles the Velvet Duck; but when once fairly under way, it flies with rapidity and to a great distance, passing close to the water during heavy gales, but at the height of forty or fifty yards in calm and pleasant weather. It is an uncommonly shy bird, and therefore difficult to be obtained, unless shot at while on wing, or when asleep, and as it were at anchor on our bays, or near the shore, for it dives as suddenly as the Velvet and Scoter Ducks, eluding even the best percussion-locked guns. The female, which was killed as she flew off from the nest, uttered a rough uncouth guttural cry, somewhat resembling that of the Goosander on similar occasions; and I have never heard any other sound from either sex.

The migration of the Surf Ducks eastward from our southern coast, begins at a very early season, as in the beginning of March none are to be seen in the New Orleans markets. When I was at Eastport in Maine, on the 7th of May, 1833, they were all proceeding eastward. How far up the St. Lawrence they advance in winter I have not learned, but they must give a decided preference to the waters of that noble stream, if I may judge by the vast numbers which I saw apparently coming from them as we approached the Labrador coast. I have never seen this species on any fresh-water lake or river, in any part of the interior, and therefore consider it as truly a marine Duck.

During their stay with us, they are always seen in considerable numbers together, and, unless perhaps during the breeding season, they seem to be gregarious; for even during their travels northward they always move in large and compact bodies. When I was at Newfoundland, I was assured that they breed there in considerable numbers on the lakes of the interior. My friend Professor MacCulloch, of Pictou, however, informs me that none are seen in Nova Scotia in summer. A gentleman of Boston, with whom I once crossed the Atlantic, assured me that the species is extremely abundant on the northern shores of the Pacific Ocean, and about the mouth of Mackenzie's river. Mr. Townsend mentions it as being also found on the Columbia. It appears that a single specimen of the Surf Duck has been procured on the shores of Great Britain; and this has induced the ornithologists of that country to introduce it as a constituent of its Fauna.

In all the individuals which I have examined, I have found the stomach to contain fish of different kinds, several species of shell-fish, and quantities of gravel and sand, some of the fragments being of large size. Their flesh is tough, rank, and fishy, so as to be scarcely fit for food.

In the young males, in the month of September, the whole upper plumage

is mottled with darkish-brown and greyish-white, the latter colour margining most of the feathers. The neck has a considerable extent of dull greyish-white, spread over two or three inches, and approaching toward the cheeks and throat. This colour disappears about the beginning of January, when they become of a more uniform dark tint, the upper part of the head brownish-black, without any white spot; there is a patch of brownish-white at the base of the upper mandible on each side; another of an oblong form over the ear, and on the nape are elongated greyish-white marks; the bill and feet dusky-green, the iris brown.

BLACK or SURF DUCK, *Anas perspicillata*, Wils. Amer. Orn., vol. viii. p. 49.
FULIGULA PERSPICILLATA, Bonap. Syn., p. 389.
OIDEMIA PERSPICILLATA, *Surf Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 449.
BLACK or SURF DUCK, Nutt. Man., vol. ii. p. 416.
SURF-DUCK, *Fuligula perspicillata*, Aud. Orn. Biog., vol. iv. p. 161.

Male, 20, 33½. Female, 19, 31½.

Abundant from Nova Scotia to Maryland during winter, and removing southward to the mouth of the Mississippi in severe weather. Never seen in the interior. Breeds from Labrador northwards.

Adult Male.

Bill about the length of the head, very broad, as deep as broad at the base, depressed towards the end, which is rounded. Upper mandible with the dorsal outline convex and descending, before the nostrils concave, on the unguis convex and declinate; the ridge broad and convex at the base; the sides at the base erect, bulging, and very broad, towards the end convex, the edges soft, with about 30 internal lamellæ, for two-thirds from the base they are nearly parallel and straight, but towards the end ascending, the unguis very soft, somewhat triangular and rounded. Lower mandible flattened, with the angle long and rather narrow, the dorsal line slightly convex, the edges with about 35 lamellæ. Nostrils sub-medial, elliptical, large, pervious, near the ridge.

Head large, oblong, flattened above. Eyes of moderate size. Neck short and thick. Body large, and much depressed. Feet short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes nearly double the length of the tarsus, connected by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick margin, the third and fourth about equal and longest. Claws small, that of the first toe very

small and curved, of the middle toe largest, with a dilated inner edge, of the rest slender, all rather obtuse.

Plumage soft, dense, blended, and glossy. Feathers on the head and neck of a velvety texture. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, and pointed, the first longest, the second little shorter, the rest rapidly graduated; secondaries broad and rounded, the inner elongated and tapering. Tail very short, narrow, wedge-shaped, of fourteen stiff, narrow, pointed feathers.

Upper mandible with a nearly square black patch at the base, margined with orange, unless in front, where there is a patch of bluish-white extending to near the nostrils, prominent part over the nostrils deep reddish-orange, becoming lighter towards the unguis, and shaded into rich yellow towards the margins; the unguis dingy greyish-yellow; lower mandible flesh-coloured, unguis darker. Iris bright yellowish-white. Tarsi and toes orange-red, the webs dusky, tinged with green; claws black. The plumage is of a deep black, glossed with blue. On the top of the head, between the eyes, is a roundish patch of white, and on the nape a larger patch of an elongated form.

Length to end of tail 20 inches, to end of wings 18, to end of claws 22; extent of wings 33½; bill from the angle in front 1½; from the prominence at the base 2½; along the edge of lower mandible 2 5/12; wing from flexure 9¾; tail 3¾; tarsus 1 7/12; first toe and claw 1 1/12; outer toe and claw 2¼; middle toe and claw 1 1/12 longer. Weight 2 lbs. 7 oz.

Adult Female.

Bill greenish-black; iris as in the male; feet yellowish-orange, webs greyish-dusky, claws black. The general colour of the plumage is brownish-black; darker on the top of the head, the back, wings, and tail; on the breast and sides the feathers edged with dull greyish-white.

Length to end of tail 19 inches, to end of wings 15⅝, to end of claws 18; extent of wings 31½; wing from flexure 8¾; tarsus 1⅜; middle toe 2⅜, hind toe 9/12. Weight 2 lbs. 2 oz.

In an adult male, the tongue is 1 inch 9 twelfths long, has numerous conical papillæ at the base, is deeply grooved along the middle, has two lateral series of bristles, and terminates in a thin rounded lobe, 2 twelfths long. On the middle line of the upper mandible are about ten short conical papillæ, and on each of its margins about 35 lamellæ; on the lower an equal number. The heart is 1 inch 8 twelfths long, 1 inch 2 twelfths broad. The œsophagus, 8½ inches long, is wide, its diameter at the upper part being 1 inch, towards the middle of the neck 1¼ inches. The proventriculus is 1⅓ inches long; its glandules cylindrical, 1½ twelfths in length, and, as in all other ducks, arranged so as to form a complete belt. The stomach is a powerful gizzard of a roundish form, 1 inch 10 twelfths long, 1 inch 10

twelfths broad, its lateral muscles very large, the right 10 twelfths thick, the left 9 twelfths. In the stomach were various small bivalve shells and much gravel. The cuticular lining longitudinally rugous; the grinding plates ¾ inch in diameter. The intestine, 5 feet 7 inches in length, has an average diameter of 6 twelfths. The rectum is 7½ inches long, 8 twelfths in diameter. Of the cœca one is 3 inches 4 twelfths long, cylindrical, obtuse, 2½ twelfths in diameter, the other 4½ inches long.

The aperture of the glottis is 8 twelfths long, with numerous minute papillæ behind. The trachea presents the same structure as that of the Velvet Duck. Its upper rings, to the number of 9, are very narrow, and continuous with a large bony expansion 7 twelfths long, and 8 twelfths broad. Beyond this part its diameter is 5 twelfths, gradually diminishes to 3 twelfths about the middle, then enlarges to 5 twelfths. In this part the number of rings is 78. Then comes a roundish or transversely elliptical enlargement, 1 inch 2 twelfths in breadth, 9 twelfths in length, convex before, slightly concave behind, and composed of about 12 united rings. The trachea then contracts to 4 twelfths and presently enlarges to form the inferior larynx, which is large, ossified, but symmetrical. In this space there are 6 distinct rings, and 10 united. The entire length of the trachea is 7½ inches, its rings are all osseous and strong. The contractor muscles are very strong, pass along the sides of the lower dilatation, on which are given off the cleido-tracheals, then continue to the commencement of the inferior larynx, where the sterno-tracheals come off. The bronchial half-rings 25, unossified.

The cavity of the nose is very large, being 2 inches long, ½ inch in diameter at the lower part, continued narrow in front over the dilatation causing the external protuberance of the base of the bill. The olfactory nerves are of moderate size; the maxillary branches of the fifth pair very large.

AMERICAN SCOTER DUCK.

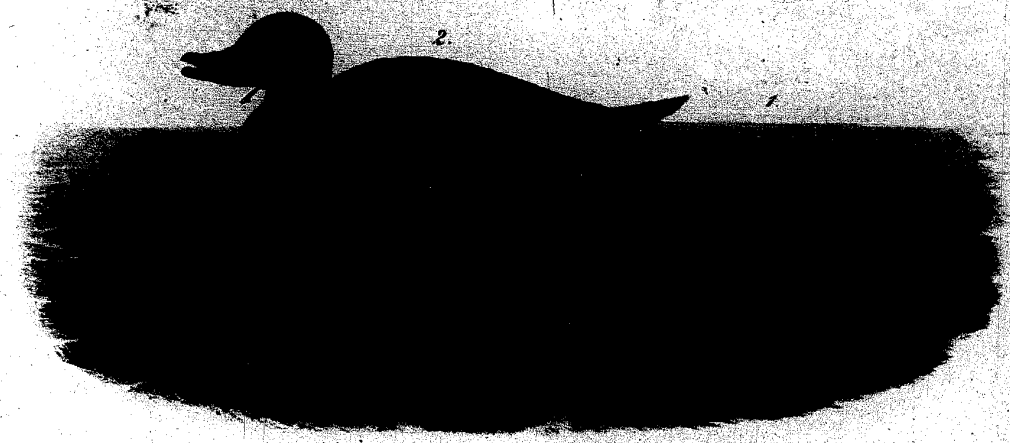
FULIGULA AMERICANA, *Swains.*

PLATE CCCCIII.—MALE AND FEMALE.

The American Scoter ranges along the whole coast of our Atlantic States in the latter part of autumn and during the winter, extending as far southward as the mouths of the Mississippi, beyond which I have not observed it. A few pairs breed on the shores of Labrador, but the great body of these birds proceed farther north, although the limits of their migration in that direction are as yet unknown.

On the 11th of July, 1833, a nest of this bird was found by my young companions in Labrador. It was placed at the distance of about two yards from the margin of a large fresh-water pond, about a mile from the shore of the Gulf of St. Lawrence, under a low fir, in the manner often adopted by the Eider Duck, the nest of which it somewhat resembled, although it was much smaller. It was composed externally of small sticks, moss, and grasses, lined with down, in smaller quantity than that found in the nest of the bird just mentioned, and mixed with feathers. The eggs, which were ready to be hatched, were eight in number, two inches in length, an inch and five-eighths in breadth, of an oval form, smooth and of a uniform pale yellowish colour. I afterwards found a female with seven young ones, of which she took such effectual care that none of them fell into our hands. On several occasions, when they were fatigued by diving, she received them all on her back, and swimming deeply, though very fast, took them to the shore, where the little things lay close among the tall grass and low tangled bushes. In this species, as in others, the male forsakes the female as soon as incubation commences.

This bird usually flies low over the water, although its flight is swift and well sustained. On land it moves more awkwardly than the Eider Duck, but in diving it is perhaps superior to that species. During their stay along our shores, they congregate in vast multitudes, and being often shot on wing in numbers, are sold in all the markets of our maritime cities ; but their flesh is very dark and has a strong fishy flavour, so as to be very unsavoury. It sometimes happens that during violent gales the Scoter is forced into fresh-water rivers, from which, however, it returns to the salt bays, inlets, or outer



American Scoter Duck.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

1. Male 2. Female.

Lith.ª Printed & Col.ª by J. T. Bowen, Phila.ª

sandy shallows of the coast, as soon as the weather permits. They are extremely abundant about Boston, New York, the New Jersey shores, and the Chesapeake; but less so to the southward, until you reach the salt lakes about New Orleans. Their food consists of shell-fish of small size, marine plants, and insects.

The difference between this species and the European bird of the same name, *Fuligula nigra*, being now well known, it is unnecessary to say any thing on the subject. I have given figures of the adult male and female, but am not acquainted with the changes which the plumage undergoes. The young are covered with pure black hair-like down. In the winter season, at which time the male in the plate was drawn, the colour of the bill is much less bright than in spring, or during the period of breeding, when the males, after they have left the females, associate together in parties, and moult in August.

It has been supposed that we have two species confounded under the common name of Scoter; but I have not succeeded in finding more than one, and my zealous young friend, Dr. THOMAS M. BREWER, of Boston, who is quite competent to the task, has been equally unsuccessful, although in the course of the last two years he has examined a great number of individuals.

SCOTER DUCK, *Anas nigra*, Wils. Amer. Orn., vol. viii. p. 135.
FULIGULA NIGRA, Bonap. Syn., p. 390.
OIDEMIA AMERICANA, *Swains. American Scoter*, Swans. and Rich. F. Bor. Amer., vol. ii. p. 450.
AMERICAN SCOTER DUCK, *Fuligula americana*, Nutt. Man., vol. ii. p. 422.
AMERICAN SCOTER DUCK, *Fuligula americana*, Aud. Orn. Biog., vol. v. p. 117.

Male, 29, 33½. Female, 17, 29½.

In winter abundant in the Bays of Boston, New York, and Chesapeake, and as far south as the mouth of the Mississippi. Never inland. Breeds from Labrador to the Arctic seas.

Adult Male.

Bill a little shorter than the head, very broad, higher than broad at the base, much depressed toward the end, which is semi-elliptical. Upper mandible with the dorsal outline convex at the base, descending and concave in the middle, again convex toward the end; the basal part tumid with a median groove, the ridge broad and slightly convex between the nostrils, the sides at first nearly erect and concave, gradually becoming more depressed and convex, the sides soft, internally lamellate, nearly parallel for half their length, dilating a little to beyond the nostrils, then contracting; the unguis very large, broadly elliptical. Lower mandible flattened, with the angle long and rather narrow, the dorsal line slightly convex, the edges parallel.

the tip rounded, the unguis very broadly elliptical. Nostrils medial, elliptical, pervious, near the ridge.

Head large, oblong, compressed, rounded above. Eyes of moderate size, Neck short and thick. Body large and much depressed. Feet very short, placed rather far behind; tarsus very short, much compressed, having anteriorly in its whole length a series of small scutella and above the outer toe a partial series, the rest covered with reticular angular scales. Hind toe small, with a free membrane beneath; anterior toes nearly double the length of the tarsus, connected by reticulated membranes having a sinus on their free margins, the inner with a lobed marginal membrane, the outer with a thick margin, the third and fourth about equal and longest. Claws small, that of the first toe very small and curved, of the middle toe largest with a dilated inner edge, of the rest slender, all rather obtuse.

Plumage soft, dense, blended, slightly glossed. Feathers on the head and neck of a velvety texture, being very small, oblong, with the terminal filaments disunited. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, pointed, the first with the inner web cut out towards the tip, leaving the feather less than a quarter of an inch in breadth at the distance of an inch and a half from its extremity; the second longest, exceeding the first by half an inch, and the third by one-twelfth, the rest rapidly graduated; secondaries broad and rounded, the inner elongated and tapering. Tail very short, graduated, acuminate, of sixteen pointed feathers.

The bulging part of the upper mandible is bright orange, paler above, that colour extending to a little before the nostrils; the rest of the upper mandible, including its basal margin to the breadth of from three to two twelfths of an inch, black, as is the lower mandible. Iris brown. Feet brownish-black. The general colour of the plumage is black, on the lower parts tinged with brown; the inner webs of the quills brownish-grey.

Length to end of tail 19 inches, to end of wings 17, to end of claws 20; extent of wings 33½; bill along the ridge 1 1/12; wing from flexure 9 1/2; tail 4; bare part of tibia 1 4/12; tarsus 1 9/12; hind toe 8/12, its claw 3/12; second toe 2 7/12, its claw 1 4/12; third toe 2 9/12, its claw 5/12; fourth toe 2 1/12, its claw 3/12. Weight 2 lbs. 9 oz.

Adult Female.

The female, which is a little smaller than the male, has scarcely any protuberance at the base of the bill, which is entirely brownish-black. The upper parts are of a light sooty-brown colour, the lower light brownish-grey.

Length to end of tail 17 inches; extent of wings 29¾.

This species differs very little from the European Scoter, being nearly of the same size, proportions, and colours. The male differs from that of the

other species in having the sides of the unguis narrowed, and the orange patch on the upper mandible less extended beyond the nostrils, and destitute of the median black line and lateral streak. There is less difference in the colour of the plumage, however, than has been represented; for adult males of this species are not sooty-brown above, but deep black.

An adult male, from Dr. T. M. BREWER, of Boston. The roof of the mouth is very concave and broad, with a median ridge, on which there are six papillæ towards the base. There are about 25 large lamellæ on each side of the upper mandible, besides a number of smaller ones anteriorly; about 40 on each side of the lower mandible. The tongue is 1 inch 10 twelfths long, its greatest breadth 9½ twelfths; the papillæ at the base long and pointed, the sides furnished with two rows of bristles, the tip thin-edged and rounded. The aperture of the glottis, and that of the posterior nares, are beset with minute papillæ. The œsophagus is 10½ inches long, of moderate width, its greatest diameter being 10 twelfths; that of the proventriculus 1 inch. The stomach is a strong gizzard of moderate size, 1½ inches in length, and 1 inch 10 twelfths in breadth; its left lateral muscle 10 twelfths in thickness, the other 9 twelfths; the epithelium tough, dense, forming two roundish slightly concave grinding surfaces. The proventricular glandules, which are rather small, of a roundish form, 1½ twelfths long, form a belt 1¼ inches in breadth. The contents of the stomach are particles of quartz. The intestine is 4 feet 11 inches long, rather wide, its diameter pretty uniform, and about 4½ twelfths. The cœca, which come off at the distance of 4 inches from the extremity of the gut, are 8 inches in length, 2½ twelfths in their greatest diameter, with the extremity obtuse.

The trachea is 6¼ inches long, flattened, its breadth 5 twelfths, contracting at the lower part to 4 twelfths. Its rings are but partially ossified, being cartilaginous at the back part. It is entirely destitute of those remarkable dilatations seen on the trachea of *Fuligula perspicillata* and *F. fusca*. The bronchi, however, are of very large size, being 1 inch 4 twelfths long, their greatest breadth ½ inch. The inferior larynx is very small, being only 3½ twelfths in breadth, in which respect it differs from that of most other male ducks. It is indeed very remarkable that this species, so nearly allied to the Velvet and Surf Ducks, should present no dilatations, either at the upper larynx, or in the course of the trachea, as are seen in them. This fact is one of many tending to shew that the strictest affinity in some points of structure is not always accompanied with a strict resemblance in some of the organs supposed to exhibit generic peculiarities. The trachea of the male of this species merely resembles that of the female of the other species. Its rings are about 100; those of the bronchi 30. The contractor muscles are strong, and terminate at the commencement of the lower larynx. There are cleido-tracheal and sterno-tracheal muscles, but no inferior laryngeal.

THE KING DUCK.

FULIGULA SPECTABILIS, *Linn.*

PLATE CCCCIV.—MALE AND FEMALE.

This beautiful species rarely advances farther south along our eastern coast than the neighbourhood of the Bay of Boston. I have, however, been assured by old and trustworthy gunners that the King Duck, about thirty years ago, was by no means of rare occurrence there during winter, and that a few had been known to breed in company with the Eider along the coast. At the period of my arrival at Labrador, the greater number of the King Ducks had proceeded farther north; and although some were seen there, we found none of their nests. I can say nothing of the habits of this bird, which, although they may be similar to those of the Eider, must yet differ in many particulars, as is the case with all birds that are nearly allied in form. The eggs of the King Duck collected by Captain JAMES CLARK ROSS, R. N., measure two inches and five-eighths by one inch and three-fourths, and have a smooth shell, of a uniform dull greenish-colour.

FULIGULA SPECTABILIS, Bonap. Syn., p. 389.
SOMATERIA SPECTABILIS, *King Duck*, Swains and Rich. F. Bor. Amer., vol. ii. p. 447.
KING DUCK, *Fuligula spectabilis*, Nutt. Man., vol. ii. p. 414.
KING DUCK, *Fuligula spectabilis*, Aud. Orn. Biog., vol. iii. p. 523.

Male, 25; wing, 11¼. Female, 20; wing, 10½.

Rare in Massachusetts during winter. Breeds from Labrador to the Arctic Seas.

Adult Male.

Bill shorter than the head, much deeper than broad at the base, somewhat depressed towards the end, which is broad and rounded. Upper mandible with a soft tumid compressed substance at the base, extending perpendicularly upon the forehead, and by a medial band of feathers divided into two broad lobes, the dorsal line beyond this descending to the unguis, then slightly curved, the ridge broadly convex, the sides sloping and convex, the edges perpendicular, with about forty-five narrow internal lamellæ, the unguis very large, broadly elliptical. Nostrils sub-medial, oblong, large, pervious, near the ridge. Lower mandible flattened, with the angle very


N° 81.
Pl. 404.
1.
2.
King Duck.
1. Male. 2. Female
Drawn from Nature by J.J.Audubon FRS.FLS.
Lith.d Printed & Col.d by J.T.Bowen Philad.a

long, rather narrow and rounded, the dorsal line short and slightly convex, the edges with about fifty lamellæ, the unguis very large and elliptical.

Head large, compressed. Neck rather short. Body bulky and much depressed. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly having a series of narrow scutella in its whole length, and a partial series above the fourth toe, the rest reticulated with angular and oblong scales; hind toe small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes having a sinus at their free margins, the inner with a broad lobed marginal membrane, the outer with a thickened edge; all obliquely scutellate above; the third and fourth about equal and longest. Claws small, arched, compressed, obtuse that of first toe very small and more curved, of middle toe largest, more depressed, and with a dilated inner edge.

Plumage short, dense, blended. Feathers on the fore part of the head extremely small, on the upper part very narrow, on the sides of the head very short, stiff, and hair-like. Wings rather short, narrow, and pointed; primary quills curved, strong, tapering, the second longest, the first almost as long, the rest rapidly graduated; secondaries short, broad, rounded, excepting the inner, which are elongated, tapering, and curved outwards. Tail very short, much rounded, of fourteen stiff narrow feathers.

Bill flesh-coloured, the sides of the upper mandible and the soft frontal lobes bright orange. Iris bright yellow. Feet dull orange, the webs dusky, the claws brownish-black. The band of feathers separating the frontal lobes, and those along their upper and posterior edges, black; lower eyelid, and a forked patch on the throat, the same. The upper part of the head light purplish-grey; the hair-like feathers on the sides of the head pale bluish-green; the fore neck cream-coloured; the sides and hind part of the neck, a patch on the wings, and another on each side of the rump, white. The hind part of the back, the scapulars, the larger wing-coverts, and the secondary quills, brownish-black, the latter glossed with green; primary quills and tail blackish-brown. Breast and abdomen blackish-brown; lower wing-coverts white, the outer brown.

Length to end of tail 25 inches, to end of wings 23; wing from flexure $11\frac{1}{4}$; tail $3\frac{3}{4}$; bill from the base of the tumid part $1\frac{1}{4}$, along the edge of lower mandible $2\frac{5}{12}$; tarsus $1\frac{3}{4}$; middle toe $2\frac{1}{12}$, its claw $\frac{1}{4}$.

Adult Female.

The female differs greatly from the male. The bill is shorter, its tumid basal lobes narrow and not ascending perpendicularly, so that the forehead is low as in most Ducks. The feathers of the head and upper part of the neck are small, soft, and uniform. The colour of the bill is pale greenish-grey; the iris dull yellow; the feet dull ochre. The head and neck are pale grey.

ish-yellow, with small lines of brownish-black. The feathers of the back are brownish-black towards the end, with yellowish-grey edges, the scapulars brownish-red on the margins. The quills and tail-feathers are deep greyish-brown; the recurved secondaries broadly edged externally with yellowish-grey. The fore part of the lower neck and breast, the sides, and lower tail-coverts, have a central mark and sub-marginal band of brownish-black, the middle of the breast scarcely spotted, being of the general colour of the lower parts, which is pale yellowish-brown.

Length to end of tail 20 inches, to end of wings 17; wing from flexure $10\frac{1}{2}$; tail $3\frac{3}{4}$; bill from the separation of the lobes $1\frac{1}{4}$; tarsus $1\frac{5}{12}$; middle toe $2\frac{1}{2}$, its claw $\frac{1}{4}$.

THE EIDER DUCK.

FULIGULA MOLLISSIMA, *Linn.*

PLATE CCCCV.—MALES AND FEMALE.

The history of this remarkable Duck must ever be looked upon with great interest by the student of nature. The depressed form of its body, the singular shape of its bill, the beautiful colouring of its plumage, the value of its down as an article of commerce, and the nature of its haunts, render it a very remarkable species. Considering it as such, I shall endeavour to lay before you as full an account of it as I have been able to obtain from my own observation.

The fact that the Eider Duck breeds on our eastern coasts, must be interesting to the American ornithologist, whose fauna possesses but few birds of this family that do so. The Fuligulæ are distinguished from all other Ducks that feed in fresh or salt water, by the comparative shortness of the neck, the great expansion of their feet, the more depressed form of their body, and their power of diving to a considerable depth, in order to reach the beds on which their favourite shelly food abounds. Their flight, too, differs from that of the true Ducks, inasmuch as it is performed nearer the surface of the water. Rarely, indeed, do the Fuligulæ fly at any considerable height over that element, and with the exception of three species, they are rarely


N°81.
Pl. 405
Eider Duck?
1. Male 2. Female.
Drawn from Nature by J.J. Audubon FRSFLS.
Lith.d Printed & Col.d by J.T. Bowen Phil.a

met with inland, unless when driven thither by storms. They differ, moreover, in their propensity to breed in communities, and often at a very small distance from each other. Lastly, they are in general more ready to abandon their females, the moment incubation has commenced. Thus the female is left in a state of double responsibility, which she meets, however, with a courage equal to the occasion, although alone and unprotected.

The Eider is now seldom seen farther south along our eastern coast than the vicinity of New York. WILSON says they are occasionally observed as far as the Capes of Delaware; but at the present day this must be an extremely rare occurrence, for the fishermen of the Jerseys informed me that they knew nothing of this Duck. In WILSON'S time, however, it bred in considerable numbers, from Boston to the Bay of Fundy, and it is still to be met with on the rocky shores and islands between these points. Farther to the eastward they become more and more plentiful, until you reach Labrador, to which thousands of pairs annually resort, to breed and spend the short summer. Many, however, proceed much farther north; but, as usual, I will here confine myself to my own observations.

In the latter part of October 1832, the Eiders were seen in considerable numbers in the Bay of Boston. A large bagful of them was brought to me by a fisherman-gunner in my employ, a person advanced in years, formerly a brave tar, and one whom I feel some pride in telling you I assisted in obtaining a small pension from our government, being supported in my application by two of my Boston friends, the one the generous GEORGE PARKMAN, M. D., the other that great statesman JOHN QUINCY ADAMS. The old man had once served under my father, and to receive a bagful of Eider Ducks from him was a gratification which you may more easily conceive than I can describe. Well, there were the Ducks, all turned out on the floor; young males still resembling their mother, others of more advanced age, and several males and females complete in all their parts, only that the bills of the former had lost the orange tint, which that part exhibits during a few weeks of the breeding season. Twenty-one there were in all, and they had been killed in a single day by the veteran and his son. Those masterly gunners told me that to procure this species, they were in the habit of anchoring their small vessel about fifty yards off the rocky isles round which these birds harbour and feed at this season. There, while the birds were passing on wing, although usually in long lines, they could now and then kill two of them at a shot. Sometimes the King Eider was also procured under similar circumstances, as the two species are wont to associate together during winter. At Boston the Eiders sold that winter at from fifty to seventy-five cents the pair, and they are much sought after by epicures.

On the 31st of May, 1833, my son and party killed six Eiders on the island of Grand Manan, off the Bay of Fundy, where the birds were seen in considerable numbers, and were just beginning to breed. A nest containing two eggs, but not a particle of down, was found at a distance of more than fifty yards from the water.

Immediately after landing on the coast of Labrador, on the 18th of June in the same year, we saw a great number of "Sea Ducks," as the gunners and fishermen on that coast, as well as on our own, call the Eiders and some other species. On visiting an island in "Partridge Bay," we procured several females. The birds there paid little attention to us, and some allowed us to approach within a few feet before they left their nests, which were so numerous that a small boat-load might have been collected, had the party been inclined. They were all placed amid the short grass growing in the fissures of the rock, and therefore in rows, as it were. The eggs were generally five or six, in several instances eight, and in one ten. Not a male bird was to be seen. At the first discharge of the guns, all the sitting birds flew off and alighted in the sea, at a distance of about a hundred yards. They then collected, splashed up the water, and washed themselves, until the boat left the place. Many of the nests were unprovided with down; some had more or less than others, and some, from which the female was absent when the party landed, were quite covered with it, and the eggs felt warm to the hand. The musquitoes and flies were there as abundant and as tormenting as in any of the Florida swamps.

On the 24th of the same month, two male Eiders, much advanced in the moult, were shot out of a flock all composed of individuals of the same sex. While rambling over the moss-covered shores of a small pond, on the 7th of July, we saw two females with their young on the water. As we approached the edges, the old birds lowered their heads and swam off with those parts lying flat on the surface, while the young followed so close as almost to touch them. On firing at them without shot, they all dived at once, but rose again in a moment, the mothers quacking and murmuring. The young dived again, and we saw no more of them; the old birds took to wing, and, flying over the hills, made for the sea, from which we were fully a mile distant. How their young were to reach it was at that time to me a riddle; but was afterwards rendered intelligible, as you will see in the sequel. On the 9th of July, while taking an evening walk, I saw flocks of female Eiders without broods. They were in deep moult, kept close to the shore in a bay, and were probably sterile birds. On my way back to the vessel, the captain and I started a female from a broad flat rock, more than a hundred yards from the water, and, on reaching the spot, we found her nest, which was placed on the bare surface, without a blade of grass within five yards of it.

It was of the usual bulky construction, and contained five eggs, deeply buried in down. She flew round us until we retired, when we had the pleasure to see her alight, walk to her nest, and compose herself upon it.

Large flocks of males kept apart, and frequented the distant sea islands at this period, when scarcely any were able to fly to any distance, although they swam about from one island to another with great ease. Before their moulting had commenced, or fully a month earlier, these male birds, we observed, flew in long lines from place to place around the outermost islands every morning and evening, thus securing themselves from their enemies, and roosted in numbers close together on some particular rock difficult to be approached by boats, where they remained during the short night. By the 1st of August scarcely an Eider Duck was to be seen on the coast of Labrador. The young were then able to fly, the old birds had nearly completed their moult, and all were moving southward.

Having now afforded you some idea of the migrations and general habits of this interesting bird from spring to the close of the short summer of the desolate regions of Labrador, I proceed, with my journals before me, and my memory refreshed by reading my notes, to furnish you with such details as may perhaps induce you to study its habits in other parts of the world.

The Eider Duck generally arrives on the coasts of Newfoundland and Labrador about the 1st of May, nearly a fortnight before the waters of the Gulf of St. Lawrence are freed from ice. None are seen there during winter, and their first appearance is looked upon with pleasure by the few residents as an assurance of the commencement of the summer season. At this period they are seen passing in long files not many feet above the ice or the surface of the water, along the main shores, and around the inner bays or islands, as if in search of the places where they had formerly nestled, or where they had been hatched. All the birds appear to be paired, and in perfect plumage. After a few days, during which they rest themselves on the shores fronting the south, most of them remove to the islands that border the coast, at distances varying from half a mile to five or six miles. The rest seek for places in which to form their nests, along the craggy shores, or by the borders of the stunted fir woods not far from the water, a few proceeding as far as about a mile into the interior. They are now seen only in pairs, and they soon form their nests. I have never had an opportunity of observing their courtships, nor have I received any account of them worthy of particular notice.

In Labrador, the Eider Ducks begin to form their nests about the last week of May. Some resort to islands scantily furnished with grass, near the tufts of which they construct their nests; others form them beneath the spreading boughs of the stunted firs, and in such places, five, six, or even

eight are sometimes found beneath a single bush. Many are placed on the sheltered shelvings of rocks a few feet above high-water mark, but none at any considerable elevation, at least none of my party, including the sailors, found any in such a position. The nest, which is sunk as much as possible into the ground, is formed of sea-weeds, mosses, and dried twigs, so matted and interlaced as to give an appearance of neatness to the central cavity, which rarely exceeds seven inches in diameter. In the beginning of June the eggs are deposited, the male attending upon the female the whole time. The eggs, which are regularly placed on the moss and weeds of the nest, without any down, are generally from five to seven, three inches in length, two inches and one-eighth in breadth, being thus much larger than those of the Domestic Duck, of a regular oval form, smooth-shelled, and of a uniform pale olive-green. I may here mention, by the way, that they afford delicious eating. I have not been able to ascertain the precise period of incubation. If the female is not disturbed, or her eggs removed or destroyed, she lays only one set in the season, and as soon as she begins to sit the male leaves her. When the full complement of eggs has been laid, she begins to pluck some down from the lower parts of her body; this operation is daily continued for some time, until the roots of the feathers, as far forward as she can reach, are quite bare, and as clean as a wood from which the undergrowth has been cleared away. This down she disposes beneath and around the eggs. When she leaves the nest to go in search of food, she places it over the eggs, and in this manner, it may be presumed to keep up their warmth, although it does not always insure their safety, for the Black-backed Gull is apt to remove the covering, and suck or otherwise destroy the eggs.

No sooner are the young hatched than they are led to the water, even when it is a mile distant, and the travelling difficult, both for the parent bird and her brood; but when it happens that the nest has been placed among rocks over the water, the Eider, like the Wood Duck, carries the young in her bill to their favourite element. I felt very anxious to find a nest placed over a soft bed of moss or other plants, to see, whether, like the Wood Duck on such occasions, the Eider would suffer her young ones to fall from the nest; but unfortunately I had no opportunity of observing a case of this kind. The care which the mother takes of her young for two or three weeks, cannot be exceeded. She leads them gently in a close flock in shallow waters, where, by diving, they procure food, and at times, when the young are fatigued, and at some distance from the shore, she sinks her body in the water, and receives them on her back, where they remain several minutes. At the approach of their merciless enemy, the Black-backed Gull, the mother beats the water with her wings, as if intending to

raise the spray around her, and on her uttering a peculiar sound, the young dive in all directions, while she endeavours to entice the marauder to follow her, by feigning lameness, or she leaps out of the water and attacks her enemy, often so vigorously, that, exhausted and disappointed, he is glad to fly off, on which she alights near the rocks, among which she expects to find her brood, and calls them to her side. Now and then I saw two females which had formed an attachment to each other, as if for the purpose of more effectually contributing to the safety of their young, and it was very seldom that I saw these prudent mothers assailed by the Gull.

The young, at the age of one week, are of a dark mouse-colour, thickly covered with soft warm down. Their feet at this period are proportionally very large and strong. By the 20th of July they seemed to be all hatched. They grew rapidly, and when about a fortnight old were, with great difficulty, obtained, unless during stormy weather, when they at times retired from the sea to shelter themselves under the shelvings of the rocks at the head of shallow bays. It is by no means difficult to rear them, provided proper care be taken of them, and they soon become quite gentle and attached to the place set apart for them. A fisherman of Eastport, who carried eight or ten of them from Labrador, kept them several years in a yard close to the water of the bay, to which, after they were grown, they daily betook themselves, along with some common Ducks, regularly returning on shore towards evening. Several persons who had seen them, assured me that they were as gentle as their associates, and although not so active on land, were better swimmers, and moved more gracefully on the water. They were kept until the male birds acquired their perfect plumage and mated; but some gunners shot the greater number of them one winter day, having taken them for wild birds, although none of them could fly, they having been pinioned. I have no doubt that if this valuable bird were domesticated, it would prove a great acquisition, both on account of its feathers and down, and its flesh as an article of food. I am persuaded that very little attention would be necessary to effect this object. When in captivity, it feeds on different kinds of grain and moistened corn-meal, and its flesh becomes excellent. Indeed, the sterile females which we procured at Labrador in considerable number, tasted as well as the Mallard. The males were tougher and more fishy, so that we rarely ate of them, although the fishermen and settlers paid no regard to sex in this matter.

When the female Eider is suddenly discovered on her nest, she takes to wing at a single spring; but if she sees her enemy at some distance, she walks off a few steps, and then flies away. If unseen by a person coming near, as may often happen, when the nest is placed under the boughs of the dwarf fir, she will remain on it, although she may hear people talking. On

such occasions my party frequently discovered the nests by raising the pine branches, and were often as much startled as the Ducks themselves could be, as the latter instantly sprung past them on wing, uttering a harsh cry. Now and then some were seen to alight on the ground within fifteen or twenty yards, and walk as if lame and broken-winged, crawling slowly away, to entice their enemies to go in pursuit. Generally, however, they would fly to the sea, and remain there in a large flock until their unwelcome visiters departed. When pursued by a boat, with their brood around them, they allowed us to come up to shooting distance, when, feigning decrepitude, they would fly off, beating the water with partially extended wings, while the young either dived or ran on the surface with wonderful speed, for forty or fifty yards, then suddenly plunged, and seldom appeared at the surface unless for a moment. The mothers always flew away as soon as their brood dispersed, and then ended the chase. The cry or note of the female is a hoarse rolling croak; that of the male I never heard.

Should the females be robbed of their eggs, they immediately go off in search of mates, whether their previous ones or not I cannot tell, although I am inclined to think so. However this may be, the duck in such a case soon meets with a drake, and may be seen returning the same day with him to her nest. They swim, fly, and walk side by side, and by the end of ten or twelve days the male takes his leave, and rejoins his companions out at sea, while the female is found sitting on a new set of eggs, seldom, however, exceeding four. But this happens only at an early period of the season, for I observed that as soon as the males had begun to moult, the females whose nests had been plundered, abandoned the place. One of the most remarkable circumstances connected with these birds is, that the females with broods are fully three weeks later in moulting than the males, whereas those which do not breed begin to moult as early as they. This may probably seem strange, but I became quite satisfied of the fact while at Labrador, where, from the number which we procured in a state of change, and the vast quantities every now and then in sight, our opportunities of observing these birds in a perfectly natural state were ample.

Some authors have said that the males keep watch near the females; but, although this may be the case in countries such as Greenland and Iceland, where the Eiders have been trained into a state of semi-domestication, it certainly was not so in Labrador. Not a single male did we there see near the females after incubation had commenced, unless in the case mentioned above, when the latter had been deprived of their eggs. The males invariably kept aloof and in large flocks, sometimes of a hundred or more individuals, remaining out at sea over large banks with from seven to ten fathoms of water, and retiring at night to insular rocks. It seemed very

wonderful that in the long lines in which we saw them travelling, we did not on any occasion discover among them a young bird, or one not in its mature plumage. The young males, if they breed before they acquire their full colouring, must either be by themselves at this period, or with the barren females, which, as I have already said, separate from those that are breeding. I am inclined to believe that the old males commence their southward migration before the females or the young, as none were to be seen for about a fortnight before the latter started. In winter, when these Ducks are found on the Atlantic shores of the United States, the males and females are intermingled; and at the approach of spring, the mated pairs travel in great flocks, though disposed in lines, when you can distinctly see individuals of both sexes alternating.

The flight of the Eider is firm, strong, and generally steady. They propel themselves by constant beats of the wings, undulating their lines according to the inequality of surface produced by the waves, over which they pass at the height of a few yards, and rarely more than a mile from the shores. Few fly across the Gulf of St. Lawrence, as they prefer following the coasts of Nova Scotia and Newfoundland, to the eastern entrance of the straits of Belle Isle, beyond which many proceed farther north, while others ascend that channel and settle for the season along the shores of Labrador, as far up as Partridge Bay, and still farther up the St. Lawrence. Whilst on our waters, or at their breeding grounds, the Eiders are not unfrequently seen flying much higher than when travelling, but in that case they seem to be acting with the intention of guarding against their enemy man. The velocity of their flight has been ascertained to be about eighty miles in the hour.

This species dives with great agility, and can remain a considerable time under water, often going down in search of food to the depth of eight or ten fathoms, or even more. When wounded, however, they soon become fatigued in consequence of the exertion used in diving, and may be overtaken by a well-manned boat in the course of half an hour or so, as when fatigued they swim just below the surface, and may be struck dead with an oar or a boat-hook.

Their food consists principally of shell-fish, the shells of which they seem to have the power of breaking into pieces. In many individuals which I opened, I found the entrails almost filled with small fragments of shells mixed with other matter. Crustaceous animals and their roe, as well as that of various fishes, I also found in their stomach, along with pebbles sometimes as large as a hazel nut. The œsophagus, which is in form like a bag, and is of a leathery firm consistence, was often found distended with food, and usually emitted a very disagreeable fishy odour. The gizzard is ex-

tremely large and muscular. The trachea of the young male, so long as it remains in its imperfect plumage, or for the first twelve months, does not resemble that of the old male. The males do not obtain their full plumage until the fourth winter. They at first resemble the mother, then gradually become pie-bald, but not in less time than between two and three years.

The Eider Duck takes a heavy shot, and is more easily killed on wing than while swimming. When on shore they mark your approach while you are yet at a good distance, and fly before you come within shot. Sometimes you may surprise them while swimming below high rocks, and, if you are expert, then shoot them; but when they have first seen you, it is seldom that you can procure them, as they dive with extreme agility. While at Great Macatina Harbour, we discovered a large basin of water, communicating with the sea by a very narrow passage about thirty yards across, and observed that at particular stages of the tides the Eider Ducks entered and returned by it. By hiding ourselves on both sides of this channel, we succeeded in killing a good number, but rarely more than one at a shot, although sometimes we obtained from a single file as many as we had of gun-barrels.

Excepting in a single nest, I found no down clean, it having been in every other instance more or less mixed with small dry fir twigs and bits of grass. When cleaned, the down of a nest rarely exceeds an ounce in weight, although from its great elasticity, it is so bulky as to fill a hat, or if properly prepared even a larger space. The eggers of Labrador usually collect it in considerable quantity, but at the same time make such havoc among the birds, that at no very distant period the traffic must cease.

EIDER DUCK, *Anas mollissima*, Wils. Amer. Orn., vol. viii. p. 122.
FULIGULA MOLLISSIMA, Bonap. Syn., p. 389.
SOMATERIA MOLLISSIMA, *Eider*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 448
EIDER DUCK, Nutt. Man., vol. ii. p. 406.
EIDER DUCK, *Fuligula mollissima*, Aud. Orn. Biog., vol. iii. p. 344; vol. v. p. 611.

Male, 25, 42. Female, 24, 39.

Breeds in Maine, on the Bay of Fundy, in Labrador, Newfoundland, as far northward as travellers have proceeded. Common in winter from Nova Scotia to Massachusetts; rarely seen in New York.

Adult Male.

Bill about the length of the head, deeper than broad at the base, somewhat depressed towards the end, which is broad and rounded. Upper mandible with a soft tumid substance at the base, extending upon the forehead, and deeply divided into two narrow rounded lobes, its whole surface marked with divergent oblique lines, the dorsal outline nearly straight and sloping

to beyond the nostrils, then curved, the ridge broad at the base, broadly convex towards the end, the edges perpendicular, obtuse, with about fifty small lamellæ on the inner side, the unguis very large, elliptical. Nostrils sub-medial, oblong, large, pervious, nearer the ridge than the edge. Lower mandible flattened, with the angle very long, rather narrow and rounded, the dorsal line short and slightly convex, the edges with about sixty lamellæ, the unguis very broad, elliptical.

Head very large. Eyes of moderate size. Neck of moderate length, rather slender at its upper part. Body bulky and much depressed. Wings rather small. Feet very short, strong, placed rather far behind; tarsus very short, compressed, anteriorly having a series of scutella in its whole length, and a partial series above the fourth toe, the rest reticulated with angular scales. Hind toe small, with a free membrane beneath; anterior toes double the length of the tarsus, connected by reticulated membranes, having a sinus at their free margins, the inner with a broad lobed marginal membrane, the outer with a thickened edge; all obliquely scutellate above, the third and fourth about equal and longest. Claws small, that of first toe very small and curved, of middle toe largest, all rather depressed and blunt.

Plumage short, dense, soft, blended. Feathers on the fore part of the head extremely small; on the upper part very narrow, on the occiput and upper and lateral parts of the neck hair-like, stiff and glossy. Wings rather short, narrow, pointed; primary quills curved, strong, tapering, the first longest, the second scarcely shorter, the rest rapidly graduated; secondaries short, broad, rounded, the inner elongated, tapering, and recurved. Tail very short, much rounded, of sixteen narrow feathers.

Bill pale greyish-yellow, the unguis lighter, the soft tumid part pale flesh-colour. Iris brown. Feet dingy light green, the webs dusky. Upper part of the head bluish-black; the central part from the occiput to the middle white. The hair-like feathers on the upper part and sides of the neck are of a delicate pale green tint. The sides of the head, the throat, and the neck are white, the fore neck at its lower part of a fine colour intermediate between buff and cream-colour. The rest of the lower surface is brownish-black, as are the upper tail-coverts, and the central part of the rump. The rest of the back, the scapulars, smaller wing-coverts, and inner curved secondary quills, white, the scapulars tinged with yellow. Secondary coverts and outer secondaries brownish-black; primaries and tail-coverts greyish-brown.

Length to end of tail 25 inches, to end of wings 21½, to end of claws 27; extent of wings 42; wing from flexure 11½; tail 4¼; bill from extremity of tumid part 2$\frac{15}{16}$, from its notch 2$\frac{3}{16}$, along the edge of lower mandible 2$\frac{13}{16}$;

tarsus 1¾; middle toe 2$\frac{1}{4}$, its claw $\frac{7}{12}$. Weight in winter, 5 lbs. 5½ oz.; in breeding time 4 lbs. 8¾ oz.

Adult Female.

The female differs greatly from the male. The bill is shorter, its tumid basal part much less and narrower. Feathers of the head and upper part of the neck are very small, soft, and uniform; the scapulars and inner secondaries are not elongated, as in the male. Bill pale greyish-green; iris and feet as in the male. The head and neck all round light brownish-red, with small lines of brownish-black. Lower part of neck all round, the whole upper surface, the sides, and the lower tail-coverts of the same colours, but there the brownish-black markings are broad. Secondary quills and larger coverts greyish-brown, tipped with white, primaries brownish-black; tail-feathers greyish-brown. Breast and abdomen greyish-brown, obscurely mottled.

Length to end of tail 24 inches, to end of wings 20½, to end of claws 27; extent of wings 39; wing from flexure 11¼; tail 4; bill 3$\frac{7}{12}$; tarsus 1¾; middle toe 2$\frac{7}{12}$, its claw $\frac{5}{12}$. Weight in winter 4 lbs. 4½ oz.; in breeding time 3 lbs. 12 oz.

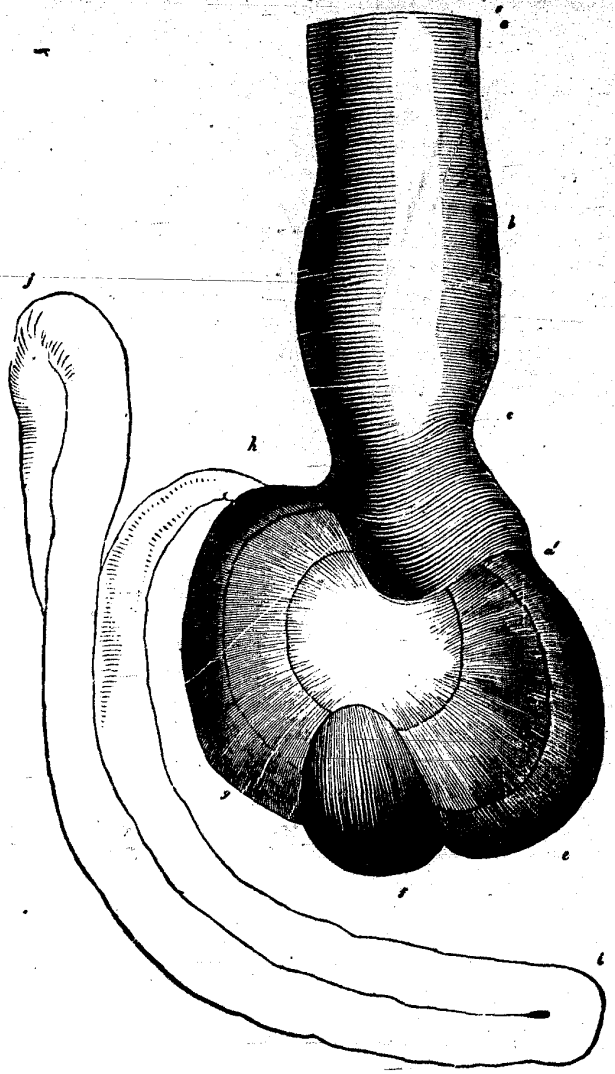
The down of the female is light grey; that of the male on the white parts is pure white, on the dark, greyish-white.

I have represented three of these birds in a state of irritation. A mated pair, having a few eggs already laid, have been approached by a single male, and are in the act of driving off the intruder, who, to facilitate his retreat, is lashing his antagonists with his wings.

Adult Male, from Dr. T. M. Brewer. The roof of the mouth is broadly and deeply concave; the posterior aperture of the nares linear, 10 twelfths long, margined with two rows of very pointed papillæ. Tongue 2 inches long, convex above, with a large median groove, fleshy, very thick, with a semicircular thin-edged horny tip; the breadth at the base 4¾ twelfths, at the tip 4 twelfths; the sides with two longitudinal series of bristles. The width of the mouth is 1 inch 3 twelfths. The œsophagus is 10½ inches long, for 4½ inches, its width is 1 inch, it then enlarges so as to form what might be considered as a kind of crop, 1 inch 7 twelfths in width; after this it continues of the uniform diameter of 1 inch, but in the proventriculus, Fig. 1, *b c*, enlarges to 1¼ inches. Its muscular walls are very thick, and the external fibres conspicuous, the inner coat longitudinally plicate. The left lobe of the liver is 2 inches 2 twelfths long, the right lobe 4 inches. The gall-bladder elliptical, 1 inch 5 twelfths in length, 11 twelfths in breadth. The stomach, *c d e f g h*, is a gizzard of enormous size, placed obliquely, transversely elliptical, its length 2½ inches, its breadth 3 inches. The proventricular glands are extremely numerous, and form a belt 2 inches in

breadth. The left muscle of the stomach, *d e*, is 1¼ inches thick, the right, *g h*, 1 inch 2 twelfths; the epithelium very thick, and of a horny texture, with two elliptical convex grinding plates, of which the right is 2 inches in length, the left 1 inch 7 twelfths. Intestine 74 inches long; the width of

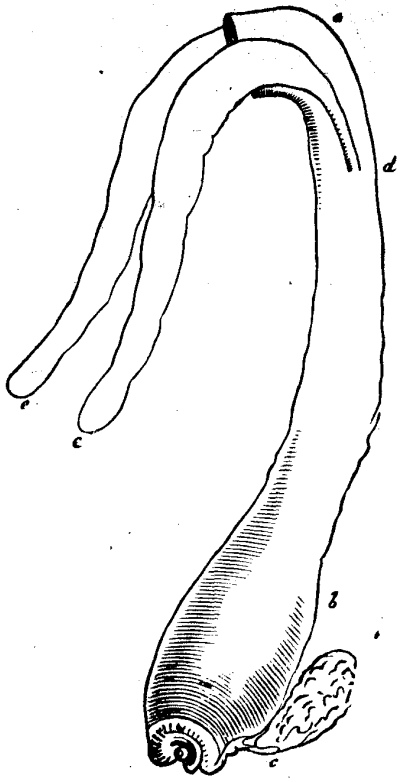
Fig. 1.



the duodenum, *h i j*, ½ inch, diminishing to 5 twelfths; the rectum, Fig. 2, *a b*, 7 twelfths in width; the cœca, *c c*, 3½ inches long, 4 inches distant from the extremity; their greatest width 4½ twelfths, for an inch at the base only 1 twelfth; the cloaca very slightly dilated, its breadth being only 8 twelfths.

The trachea is 9¼ inches long, nearly of the uniform width of 5 twelfths, moderately flattened; the rings 130, well ossified, ending in a transversely oblong dilatation, projecting more toward the left side, 1 inch in breadth, ½ inch in length. Bronchial half rings 32, the bronchi very wide, rings very narrow and cartilaginous. The contractor muscles are very large, and expanded over the whole anterior surface. At the distance of 1½ inches from the tympanum they give off the cleido-tracheal muscles, and at the tympanum itself the sterno-tracheal.

Fig. 2.



N°82

Pl 406

Golden Eye Duck

1 Male 2 Female

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.d Printed & Col.d by J. T. Bowen, Philad.a

GOLDEN-EYE DUCK.

FULIGULA CLANGULA, *Linn.*

PLATE CCCCVI.—MALE AND FEMALE.

You have now before you another of our Ducks, which at least equals any of the rest in the extent of its migrations. Braving the blasts of the north, it visits the highest latitudes in spring, and returns at the approach of winter, spreading over the whole country, as if it seemed not to care in what region it spends its time, provided it find abundance of water. Now propelling itself gaily, it may be seen searching the pebbly or rocky bottom of the Ohio, or diving deep in the broad bays of Massachusetts or the Chesapeake. Presently it emerges with a cray-fish or a mussel held firmly in its bill. It shakes its head, and over its flattened back roll the large pearly drops of water, unable to penetrate the surface of its compact and oily plumage. The food is swallowed, and the bird, having already glanced around, suddenly plunges headlong. Happy being! Equally fitted for travelling through the air and the water, and not altogether denied the pleasure of walking on the shore; endowed with a cunning, too, which preserves you from many at least of the attempts of man to destroy you; and instinctively sagacious enough to place your eggs deep in the hollow of a tree, where they are secure from the nocturnal prowler, and, amid the down of your snowy breast, are fostered until the expected young come forth. Then with your own bill you carry your brood to the lake, where, under your tender care, they grow apace. The winged marauders, rapid as their flight may be, cannot injure you there; for while your young ones sink into the deep water, you arise on whistling wings, and, swifter than Jer Falcon, speed away.

In South Carolina the Golden-eye is abundant during winter, when it at times frequents the reserves of the rice-planters. I have also met with it on the water-courses of the Floridas at that season. From these countries westward and northward, it may be found in all parts of the Union where the waters are not frozen. It is seldom seen on small ponds entirely surrounded by trees, but prefers open places, and on the Ohio is generally found in the more rapid parts, on the eddies of which it dives for food.

This species exhibits a degree of cunning which surpasses that of many other Ducks, and yet at times it appears quite careless. When I have been

walking, without any object in view, along the banks of the Ohio, between Shippingport and Louisville, I have often seen the Golden-eyes, fishing almost beneath me, when, although I had a gun, they would suffer me to approach within a hundred paces. But at other times, if I crawled or hid myself in any way while advancing towards them, with a wish to fire at them, they would, as if perfectly aware of my intentions, keep at a distance of fully two hundred yards. On the former occasion they would follow their avocations quite unconcernedly; while on the latter, one of the flock would remain above as if to give intimation of the least appearance of danger. If, in the first instance, I fired my gun at them, they would all dive with the celerity of lightning, but on emerging, would shake their wings as if in defiance. But if far away on the stream, when I fired at them, instead of diving, they would all at once stretch their necks, bend their bodies over the water, and paddle off with their broad webbed feet, until the air would resound with the smart whistling of their wings, and away they would speed, quite out of sight, up the river. In this part of the country, they are generally known by the name of "Whistlers."

I have observed that birds of this species rarely go to the shores to rest until late in the evening, and even then they retire to secluded rocks, slightly elevated above the surface, or to the margins of sand-bars, well protected by surrounding waters. In either case, it is extremely difficult for a man to get near them; but it is different with the sly racoon, which I have on several occasions surprised in the dawn, feeding on one which it had caught under night. Yet, on some of the bays of our sea-coasts, the Whistlers are easily enticed to alight by the coarsest representations of their figures in wooden floats, and are shot while they pass and repass over the place to assure themselves that what they see is actually a bird of their own kind. This mode is successfully followed in the bay and harbour of Boston in Massachusetts, as well as farther to the eastward.

The Golden-eye is rarely if ever seen in the company of any other species than those which are, like itself, expert divers, such, for example, as the Mergansers, or the Buffel-headed Duck; and it is very rare to see all the individuals of a flock immersed at once. Sometimes, when suddenly surprised, they immediately dive, and do not rise again until quite out of gunshot. When wounded, it is next to impossible to catch them: for their power of remaining under water is most surprising, and the sooner one gives up the chase the better.

The Golden-eye Ducks manifest a propensity to adhere to a place which they find productive, and that to a most extraordinary degree. One day while approaching the shallow fording-place of Canoe creek, near Henderson, in Kentucky, I observed five Whistlers fishing and swimming about.

They allowed me to advance to within a few yards of the shore, when, swimming close together, and shaking their necks, they emitted their rough croaking notes. Not being desirous of shooting them, I slapped my hands smartly together, when in an instant they all went down, but suddenly rose again, and running as it were over the water for about ten yards, took flight, passed and repassed several times over the ford, and alighted on the large branches of a sycamore that hung over the creek, at no greater distance from where I stood than about twenty yards. This was the first time in my life that I had seen Golden-eyes alight on a tree. I waded to the opposite side, and gazed upon them with amazement for several minutes. When on the eve of pursuing my course, one of them, gliding downwards with nearly closed wings, launched upon the water, and at once dived. The other four followed one after another, somewhat in the manner of Pigeons or Starlings, as if to ascertain whether some danger might not still exist. I left them at their avocations, and soon after met a family of country people going to Henderson, one of whom asked me respecting the depth of the ford, to which I replied that the water was low, and added that they should be careful lest some Ducks that I had left there might frighten the horses on which the women were. The good folks, with whom I was acquainted, laughed, and we parted.

About four o'clock, as I was returning, with a fine Turkey-cock slung to my back, I met the same party, who told me that, "sure enough," the Ducks were at the ford, and I was likely to have "a good crack at them." There they were when I went up, and I forced them to fly off; but as I was proceeding, and not more than fifty yards beyond the creek, I heard their splashings as they again alighted. In the course of a fortnight I visited the place several times, but never missed finding these five Ducks there. This led me to inquire as to the cause, and, having undressed, I waded out barefooted, and examined the bottom, which I found to be composed of rather hard blue clay, full of holes bored by cray-fish. But to make myself quite sure that these creatures formed the attraction to the Ducks, I watched an opportunity, and shot two of the latter, the examination of which satisfied me on the subject.

I had long before this been convinced, that an abundant supply of food afforded a powerful attraction to migrating birds, and on this subject you may remember my remarks in the articles of the Wild Turkey and Passenger Pigeon; but I had not then, nor have I since, seen so strong an instance of pertinacity in attachment to a particular spot.

The flight of this species is powerful, extremely rapid, and wonderfully protracted. It passes along with a speed equal to that of any of the Duck tribe, and I believe can easily traverse the space of ninety miles in an hour.

The whistling of its wings may be distinctly heard when it is more than half a mile distant. This statement may be found to be in contradiction to those of probably every previous writer, for it has been a general opinion, that the greater the extent of wing the more rapid is the flight, which is anything but correct. On flying from the water, they proceed for a considerable distance very low, not rising to any height until they have advanced several hundred yards.

The only nest of the Golden-eye which I have examined, I discovered, on the 15th of June, on the margin of a small creek about eight miles from Green Bay. The female left it, probably to go in search of food, whilst I was sitting under the tree in which it was, thinking more of my peculiar situation than of birds of any kind, for I was almost destitute of ammunition, and bent on returning to my family, then in Louisiana. How exciting are such moments to the ardent observer of Nature! In an instant, hunger, fatigue, even the thoughts of my beloved wife and children, vanished; and in a few minutes I was safely lodged on the tree, and thrusting my arm into the cavity of a large broken branch. Nine beautiful, greenish, smooth eggs, almost equally rounded at both ends, were at my disposal. They were laid on some dry grass of the kind that grew on the edges of the creek, and were deeply imbedded in the down of the bird. Not being then aware of the necessity of measuring or keeping eggs, I roasted them on some embers, and finding them truly delicious, soon satisfied my hunger. While I was eating them, the bird returned, but no male was to be seen. Whether many of these birds breed within the limits of the Union I cannot tell. Dr. RICHARDSON says they are abundant in the Fur Countries, and Mr. TOWNSEND states, that they are plentiful on the Rocky Mountains and along the north-west coast of America.

Of the changes which the young males undergo, nothing is known beyond the fact, that the young of both sexes resemble the adult female, until the approach of the first spring, when their general migration northward removes them from our observation.

At the approach of spring, I have observed this species swell the throat and the feathers of the head, and emit their rough croaking notes very frequently. The males at this period become very pugnacious, though, after all, they remove northward together, preceding the females for at least a fortnight. They usually spend the autumn and the earlier parts of winter separate from the females. These birds have, like the Goosanders, a habit of shaking their heads violently on emerging from the water. Their flesh is fishy, and in my opinion unfit for being eaten, unless in cases of excessive hunger. The food of this species, while on fresh water, consists of fish of various kinds, mollusca, young frogs, tadpoles, crayfish, and, I believe, some

kinds of grass. When on salt water, they feed principally on bivalves and fishes of different species.

GOLDEN-EYE, *Anas Clangula*, Wils. Amer. Orn., vol. viii. p. 62.
FULIGULA CLANGULA, Bonap. Syn., p. 393.
CLANGULA VULGARIS, *Common Golden-eye*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 456.
CLANGULA BARROVII, *Rocky-mountain Garrot*, Swains and Rich. F. Bor. Amer., vol. ii. p. 458.
COMMON GOLDEN-EYE, Nutt. Man., vol. ii. p. 441.
GOLDEN-EYE DUCK, *Fuligula Clangula*, Aud. Orn. Biog., vol. iv. p. 318; vol. v. p. 105.

Male, 20, 31½. Female, 16, 28.

Abundant during winter on all the running streams of the interior, as well as along the Atlantic coast, as far south as the Gulf of Mexico. Breeds in high northern latitudes. Accidental in the North-eastern Districts. Rocky Mountains and Columbia river.

Adult Male in winter.

Bill shorter than the head, deeper than broad at the base, gradually depressed toward the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then slightly concave, and finally decurved; the ridge broad and rather concave at the base, narrowed between the nostrils, convex towards the end, the frontal angles long, the sides erect at the base, sloping and convex towards the end, the edges soft, with about fifty lamellæ, the unguis oblong and decurved. Nostrils medial, linear, pervious, nearer the ridge than the margin. Lower mandible flattened, ascending, nearly straight, a little curved at the base, the angle long, rather narrow, the dorsal line very slightly convex, the edges with about fifty lamellæ, the unguis broadly elliptical.

Head large, compressed. Eyes of moderate size. Neck short and thick. Body compact, much depressed. Feet very short, placed far back; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a broad free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow, lobed, marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with numerous narrow scutella. Claws small, slightly arched, compressed, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft and blended; feathers on the fore part of the head and cheeks very small and rounded, on the upper and hind parts, linear and elongated, as they also are on the lateral and hind parts of the upper neck, so

that when raised they give the head a very tumid appearance, which is the more marked that the feathers of the neck beneath are short. Wings small, decurved, pointed; the outer primaries pointed, the first generally longest, the second slightly shorter, in some specimens a little longer, the rest rapidly graduated; the secondaries incurved, obliquely rounded, the inner much elongated. Tail short, graduated, of sixteen feathers.

Bill black. Iris bright yellow. Feet orange-yellow, webs dusky, claws black. Head and upper part of neck deep green, changing to purple in certain lights. Back, posterior scapulars, inner secondaries, edge of wing, alula, primary coverts, primary quills, and four or five outer secondaries, black,—the back being darker and glossy, the wing-feathers tinged with brown. An elliptical patch between the base of the bill and the eye, lower part of neck all round, sides of the body anteriorly, the lower parts generally, the scapulars, excepting their margins, which are black, a large patch on the wing, including many of the smaller coverts, some of the secondary coverts, and six or seven of the secondary quills, pure white. The basal part of the secondary coverts black. Axillar feathers and lower wing-coverts dusky; the elongated feathers of the sides of the inner, some of them also their outer margins black, that colour in those of the innermost covering the whole inner web. The feathers on the legs, and along the sides of the rump, dusky. The tail brownish-grey.

Length to end of tail 20 inches, to end of wings 17½, to end of claws 20¼; extent of wings 31½; bill along the ridge 1⅛, from the angles 2, along the edge of lower mandible 2 3/16; wing from flexure 9; tail 4½; tarsus 1 5/16; hind toe 6/16, its claw 2/16; second toe 1 9/16, its claw 3/16; third toe, 2¼, its claw 4/16; fourth toe 2 4/16, its claw 3/16. Weight 2 lbs. 4½ oz.

Of another male, length to end of tail 19½, to end of claws 21½, to end of wings 17; extent of wings 31.

Adult Female.

The female is much smaller. Bill dusky, a portion at the end, not however including the unguis, dull yellowish-orange. Eyes and feet as in the male. Head and upper part of neck dull reddish-brown. Lower part of neck and the sides of the body brownish-grey, the feathers margined with pale grey. Upper parts greyish-brown, much darker behind; tail brownish-grey; wings brownish-black, seven of their coverts, excepting at the bases, white, the smaller coverts lighter and tipped with greyish-white; the legs and sides of the rump greyish-brown.

Length to end of tail 16 inches, to end of wings 15, to end of claws 17¼; extent of wings 28; wing from flexure 8½; tail 3¼; bill along the ridge 1⅛, from the angles 1⅜, along the lower mandible 1 3/16; tarsus 1 3/16; hind toe 4/16, its claw 1/16; middle toe 2 4/16, its claw 3/16; outer toe 1/16 longer; inner toe and claw 2/16. Weight 1⅜ lbs.

Western Duck.

Male.

Drawn from Nature by J.J.Audubon FRSFLS.

Lith.ª Printed & Col.ª by J.T.Bowen Philad.ª

WESTERN DUCK.

FULIGULA DISPAR, *Gmel.*

PLATE CCCCVII.—MALES.

This beautiful species, which was discovered by STELLER on the north-west coast of America, has never been known to visit our Atlantic shores. So very scarce indeed is it, that all my exertions to obtain a specimen have failed. It is surprising that it was not procured by any of the great navigators and travellers who have visited the northern and western coast within these fifteen years. As it has been acknowledged, however, as belonging to our Fauna, I have introduced a figure of it taken by my son JOHN WOODHOUSE, from a beautiful specimen in the Museum of Norwich, in England. It is said to have been shot at Yarmouth, in the county of Norfolk, in the winter of 1830.

ANAS DISPAR and ANAS STELLERI, Gmel. Syst. Nat., vol. i. p. 535, 518.
FULIGULA STELLERI, Bonap. Syn., p. 394.
WESTERN DUCK, *Fuligula dispar*, Aud. Orn. Biog., vol. v. p. 253.

Male, 16; wing, 8¼.
North-west coast.
Adult Male.

Bill shorter than the head, deeper than broad at the base, depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping in the middle, then slightly concave, at the end decurved; the ridge broad and flat at the base, afterwards convex, as are the sides, the unguis elliptical. Nostrils sub-basal, oblong. Lower mandible flat, with the angle long and rather narrow, the unguis elliptical.

Head large, compressed; neck rather short and thick. Feet short, stout, placed rather far behind; tarsus very short, compressed, reticulate with a series of larger scales in front. Hind toe small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, the inner with a narrow lobed marginal membrane; the third longest, the fourth nearly equal; all covered above with numerous short scutella. Claws small, arched, obtuse.

Plumage dense, soft, blended. Wings of moderate length, pointed; the

first quill longest; secondaries short, broad, rounded, the inner elongated, lanceolate, and decurved, as are the scapulars. Tail rather short, pointed, of fourteen feathers.

Bill dull greyish-blue, as are the feet, the claws yellowish-grey. The upper part of the head and a broad band surrounding the neck are white; the throat; some feathers around the eye are black; a light green patch in the loral space, and a transverse patch of the same on the nape, margined behind and laterally with black. A broad band on the neck and the whole of the back is velvet-black, with green reflections; the smaller wing-coverts white; the secondary coverts bluish-black, terminating in a broad white band; the elongated secondaries and scapulars with the inner web white, the outer black, with blue reflections; the primaries and coverts brownish-black, the tail black, as are the lower tail-coverts and abdomen; the rest of the lower parts deep reddish-buff, fading toward the shoulders and neck into pure white; there is a bluish-black spot on each side of the lower part of the neck anterior to the wing.

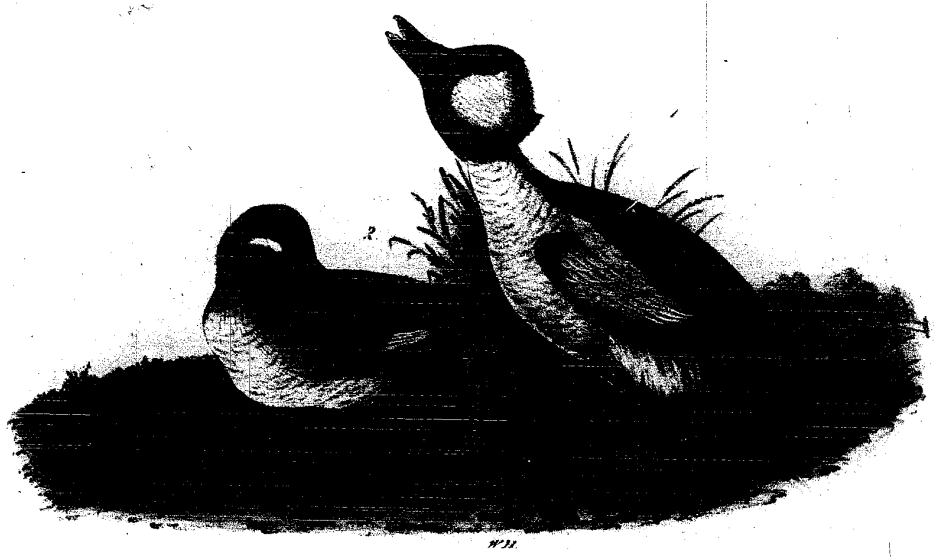
Length to end of tail 16 inches; bill along the ridge $\frac{9}{16}$; wing from flexure $8\frac{3}{8}$; tail 4; tarsus $1\frac{3}{16}$; inner toe and claw $1\frac{1}{2}$; middle toe and claw $2\frac{1}{8}$; outer toe and claw $2\frac{1}{4}$; breadth of unguis of upper mandible $\frac{3}{8}$; breadth of bill at base $\frac{1}{2}$.

BUFFEL-HEADED DUCK.

FULIGULA ALBEOLA, *Linn.*

PLATE CCCCVIII.—MALE AND FEMALE.

There are no portions of the Union on the waters of which this beautiful miniature of the Golden-eye Duck is not to be found, either during the autumnal months or in winter; and, therefore, to point out any particular district as more or less favoured by its transient visits would be useless. The miller's dam is ornamented by its presence; the secluded creeks of the Middle States are equally favoured by it as the stagnant bayous and lakes of Lower Louisiana; in the Carolinas and on the Ohio, it is not less frequent; it being known in these different districts by the names of Spirit Duck,



Buffel-headed Duck.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. 1 Male 2 Female. Lith. Printed & Col.d by J. T. Bowen, Philad.a

Butter-box, Marrionette, Dipper, and Die-dipper. It generally returns from the far north, where it is said to breed, about the beginning of September, and many reach the neighbourhood of New Orleans by the middle of October, at which period I have also observed them in the Floridas. Their departure from these different portions of our country varies from the beginning of March to the end of May. On the 11th of that month in 1833, I shot some of them near Eastport in Maine. None of them have, I believe, been found breeding within the limits of the Union. During the period of their movements towards the north, I found them exceedingly abundant on the waters of the Bay of Fundy, the males in flocks, and in full dress, preceding the females about a fortnight, as is the case with many other birds.

The Marrionette—and I think the name a pretty one—is a very hardy bird, for it remains at times during extremely cold weather on the Ohio, when it is thickly covered with floating ice, among which it is seen diving almost constantly in search of food. When the river is frozen over, they seek the head waters of the rapid streams, in the turbulent eddies of which they find abundance of food. Possessed of a feeling of security arising from the rapidity with which they can dive, they often allow you to go quite near them, though they will then watch every motion, and at the snap of your gun, or on its being discharged, disappear with the swiftness of thought, and perhaps as quickly rise again, within a few yards, as if to ascertain the cause of their alarm. I have sometimes been much amused to see the apparent glee with which these little Dippers would thus dive at the repeated snappings of a miserable flint lock, patiently tried by some vagrant boys, who, becoming fatigued with the ill luck of their piece, would lay it aside, and throw stones at the birds, which would appear quite pleased.

Their flight is as rapid as that of our Hooded Merganser, for they pass through the air by regularly repeated beats of their wings, with surprising speed; and yet this is the best time for the experienced sportsman to shoot them, as they usually fly low. Their note is a mere croak, much resembling that of the Golden-eye, but feebler. At the approach of spring, the males often swell their throats and expand the feathers of the head, whilst they utter these sounds, and whilst moving with great pomposity over the waters. Often too, they charge against each other, as if about to engage in combat, but I have never seen them actually fighting.

When these birds return to us from the north, the number of the young so very much exceeds that of the old, that to find males in full plumage is much more uncommon than toward the time of their departure, when I have thought the males as numerous as the females. Although at times they are very fat, their flesh is fishy and disagreeable. Many of them, however, are offered for sale in our markets. I have often found some of them on

inland ponds, which they seemed loth to leave, for, although repeatedly shot at, they would return. Their food is much varied according to situation. On the sea-coast, or in estuaries, they dive after shrimps, small fry, and bivalve shells; and in fresh water, they feed on small crayfish, leeches, and snails, and even grasses.

Not having found any of these birds in Labrador or Newfoundland, I am unable to say anything as to their nests. Dr. RICHARDSON states, that they frequent the rivers and fresh-water lakes throughout the Fur Countries in great numbers, but does not mention having observed them breeding. As in almost all other species of this family, the young of both sexes in autumn resemble the adult female. Mr. TOWNSEND has found this species on the streams of the Rocky Mountains, and it has been observed as far westward as Monterey in New California.

BUFFEL-HEADED DUCK, *Anas albeola*, Wils. Amer. Orn., vol. viii. p. 51.
FULIGULA ALBEOLA, Bonap. Syn., p. 394.
CLANGULA ALBEOLA, *Spirit Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 458
SPIRIT DUCK, Nutt. Man., vol. ii. p. 445.
BUFFEL-HEADED DUCK, *Fuligula albeola*, Aud. Orn. Biog., vol. iv. p. 217.

Male, 14¼, 23. Female, 13, 22¼.

Distributed throughout the country and along the Atlantic shores during autumn, winter, and spring. Texas, Upper California, Columbia river. Breeds very far north.

Adult Male.

Bill much shorter than the head, comparatively narrow, deeper than broad at the base, gradually depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then nearly straight, at the end decurved; the ridge broad and flat at the base, narrowed between the nostrils, convex towards the end, the sides convex, the edges soft, with about thirty-five lamellæ, the unguis oblong. Nostrils sub-medial, linear, pervious, nearer the ridge than the margin. Lower mandible flat, ascending, curved at the base, the angle long, rather narrow, the dorsal line very slightly convex, the edges with about forty lamellæ, the unguis broadly elliptical.

Head rather large, compressed. Eyes of moderate size. Neck short and thick. Body compact, depressed. Feet very short, placed far back, tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow lobed

marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with numerous narrow scutella. Claws small, slightly arched, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft, and blended. Feathers on the fore part of the head very small and rounded, on the upper and hind parts linear and elongated, as they also are on the lateral and hind parts of the upper neck, so that when raised, they give the head an extremely tumid appearance, which is the more marked that the feathers of the neck immediately beneath are short. Wings very small, decurved, pointed; the outer primaries pointed, the first longest, the rest rapidly graduated; the secondaries incurved, obliquely rounded, the inner much elongated and acuminate. Tail short, graduated, of sixteen feathers.

Bill light greyish-blue. Iris hazel. Feet very pale flesh-colour, claws brownish-black. Fore part of the head of a deep rich green, upper part rich bluish-purple, of which colour also are the elongated feathers on the fore part and sides of the neck, the hind part of the latter deep green; a broad band of pure white from one cheek to the other over the occiput. The coloured parts of the head and neck are splendent and changeable. The rest of the neck, the lower parts, the outer scapulars, and a large patch on the wing, including the greater part of the smaller coverts and some of the secondary coverts and quills, pure white, the scapulars narrowly margined with black, as are the inner lateral feathers. Axillary feathers brownish-black, some of them white on the margins and towards the end; lower wing-coverts brownish-black, the smaller tipped with white. The back, inner scapulars, and inner secondary quills, velvet-black. The feathers on the anterior edge of the wing are black, narrowly edged with white; alula, primary coverts, and primary quills, deep black. The feathers on the rump gradually fade into greyish-white, and those of the tail are brownish-grey, with the edges paler, and the shafts dusky.

Length to end of tail 14½ inches, to end of wings 13¾, to end of claws 15¾; extent of wings 23; wing from flexure 6¾; tail 3¼; bill along the ridge $1\frac{3}{12}$, along the edge of lower mandible $1\frac{11}{12}$; tarsus $1\frac{3}{12}$, hind toe and claw $\frac{8}{12}$; outer toe $2\frac{1}{12}$, its claw $\frac{7}{12}$; middle toe 2, its claw $\frac{7}{12}$; inner toe and claw $1\frac{9}{12}$. Weight 1 lb.

Adult Female.

The female is much smaller. The plumage of the head is not elongated as in the male, but there is a ridge of longish feathers down the occiput and nape. Bill darker than that of the male; feet greyish-blue, with the webs dusky. Head, upper part of neck, hind neck, back and wings, greyish-brown; a short transverse white band from beneath the eye, and a slight

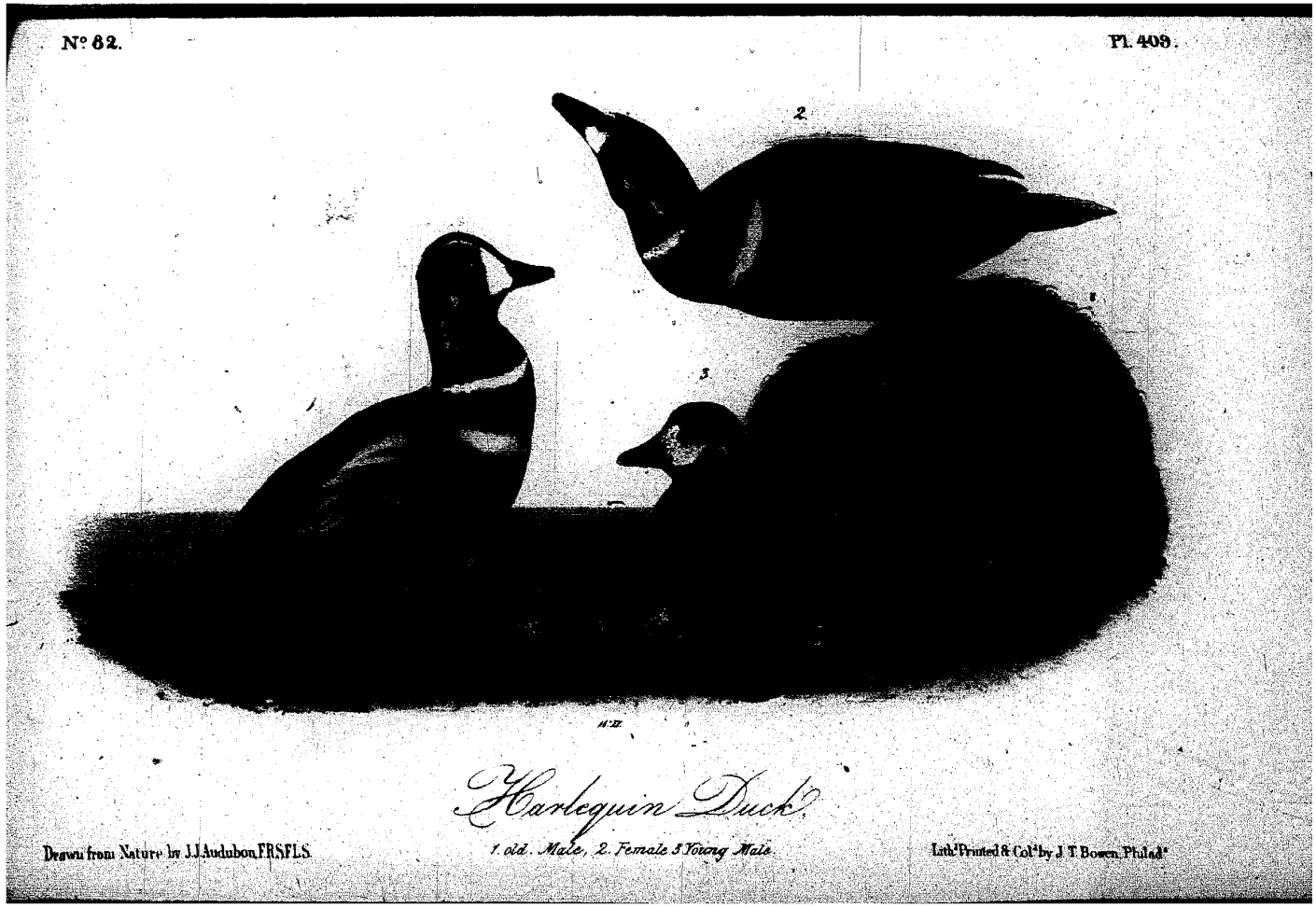
speck of the same on the lower eyelid. Six of the secondary quills white on the outer web. Lower parts white, shaded into light greyish-brown on the sides; tail dull greyish-brown.

Length to end of tail 13 inches, to end of claws 13½, to end of wings 11½; extent of wings 22¼. Weight 8 oz.

Individuals of both sexes differ much in size, and in the tints of their plumage.

In an adult male, the tongue is 1 inch and 2 twelfths long, fleshy, and of the same general form as in the other Ducks already described. The œsophagus is 6¾ inches long, passes along the right side, has a diameter at the top of 4½ twelfths, enlarges about the middle to 9 twelfths, and contracts to ½ inch as it enters the thorax. The proventriculus is 1 inch long, 8 twelfths in its greatest diameter, its glandules, which are of moderate size, forming a complete belt, as in all other Ducks. The stomach is a muscular gizzard of a roundish form, 1 inch 5 twelfths long, 1 inch 4 twelfths in breadth; its lateral muscles 5 twelfths in thickness; its epithelium tough, hard, and slightly rugous. The intestine is 3 feet 11 inches long; its average diameter 3 twelfths, its walls thick, and its inner surface villous. The rectum is 3 inches long; the cœca 2¼ inches in length, their diameter at the commencement 1 twelfth, towards the end 2 twelfths.

The trachea is 5 inches long, much flattened, its rings unossified, its diameter at the top 2¾ twelfths, towards the lower part 3 twelfths, having scarcely any appearance of dilatation at the part which is so excessively enlarged in the Golden-eyed Duck, which in form and habits is yet very closely allied. The lateral muscles are strong, and there are cleido-tracheal and sterno-tracheal muscles, as in other Ducks.


N° 82.
Pl. 409.
2.
3.
Harlequin Duck.
Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.
1. old. Male, 2. Female 3 Young Male
Lith.Printed & Col.d by J.T.Bowen. Philad.a

THE HARLEQUIN DUCK.

FULIGULA HISTRIONICA, *Linn.*

PLATE CCCCIX.—MALE, FEMALE, AND YOUNG.

I have the pleasure of presenting you with three figures of the Harlequin Duck, one a male in all the perfection of its spring plumage, the bird having attained complete maturity, another male two years old, and an adult female shot in the pairing season. No figures of the adult male or of the female have, I believe, hitherto been published.

To the south of the Bay of Boston the "Lord and Lady Duck" is rarely seen on our coast; but from that neighbourhood it becomes more plentiful as you proceed eastward; and, on reaching Maine and the entrance of the Bay of Fundy, you may see it at any period of the year among the rocky islands there. It breeds on the Seal, White Head, and Grand Manan Islands, and along the coast of Nova Scotia, Cape Breton, Newfoundland, and Labrador. Many, however, proceed much farther north, for specimens were obtained by Captain JAMES CLARK ROSS in the highest latitudes visited by him. It is extremely attached to certain localities, from which it rarely wanders unless greatly molested, and it thus remains about the islands or the parts of the coast on which it breeds, unless it be forced off by very severe weather in winter. Few persons shoot it for its flesh; not that it is inferior as food to other deep-diving Ducks, but because it is comparatively small, and difficult to be obtained. Not only is it all seasons remarkably shy and vigilant, but even if approached when on rocks, it plunges into the water the moment its keen eye catches a glance of you, dives with all the agility of the Black Guillemot, and seldom rises within shot. If you shoot at it when passing on wing, even should it be beyond reach, it plunges into the water the moment it perceives the flash,—a habit which is also occasionally observed in the Black Guillemot. It being usually found in flocks of one or two families, or of from twelve to fifteen individuals, some one always acts as a watchful sentinel, whose single note of alarm is sufficient to induce the whole to move off without hesitation. Notwithstanding all this vigilance, however, my party procured a good number of them at different times, by lying in wait for them under cover of some rocks, in the neighbourhood of which they were known to alight at certain hours of the day,

to bask in the sun and dress their plumage. On these occasions a shot seldom failed to kill several, for they fly compactly and alight close together.

On the 31st of May, 1833, I found them breeding on White Head Island, and other much smaller places of a similar nature, in the same part of the Bay of Fundy. There they place their nests under the bushes or amid the grass, at the distance of twenty or thirty yards from the water. Farther north, in Newfoundland and Labrador, for example, they remove from the sea, and betake themselves to small lakes a mile or so in the interior, on the margins of which they form their nests beneath the bushes next to the water.

The nest is composed of dry plants of various kinds, arranged in a circular manner to the height of two or three inches, and lined with finer grasses. The eggs are five or six, rarely more, measure two inches and one-sixteenth by one inch and four and a half eighths, and are of a plain greenish-yellow colour. These measurements differ a little from those of an egg sent to me by my friend Mr. HEWITSON of Newcastle-upon-Tyne, and which had been found in Ireland by Mr. ATKINSON. After the eggs are laid, the female plucks the down from the lower parts of her body, and places it beneath and around them, in the same manner as the Eider Duck and other species of this tribe. The male leaves her to perform the arduous but, no doubt to her, pleasant task of hatching and rearing the brood, and, joining his idle companions, returns to the sea-shore, where he moults in July and August, The little ones leave the nest a few hours after they burst the shell, and follow their mother to the water, where she leads them about with the greatest care and anxiety. When about a week old she walks with them to the sea, where they continue, in the same manner as the Eiders. When discovered in one of these small inland lakes, the mother emits a lisping note of admonition, on which she and the young dive at once, and the latter make for the shores, where they conceal themselves, while the former rises at a good distance, and immediately taking to wing, leaves the place for awhile. On searching along the shores for the young, we observed, that on being approached, they ran to the water and dived towards the opposite side, continuing their endeavours thus to escape, until so fatigued that we caught four out of six. When at sea, they are as difficult to be caught as the young Eiders.

The flight of the Harlequin Duck is rapid and generally straight. At sea it flies at a small height, but when flying over the land, or even when approaching it, should there be any suspicion of danger, it rises to a considerable height. Its food consists of shrimps, small fishes, roe, aquatic insects, and mollusca, which it procures by diving. The flesh is dark, and

generally tastes of fish, but that of the female is good during the period of her sojourn on the fresh-water ponds.

The male takes three years to acquire his full plumage, although many individuals breed in the second year. The female is perfect in the second spring. Dr. RICHARDSON, in the Fauna Boreali-Americana, describes a male killed on the eastern declivity of the Rocky Mountains, whence it appears that at times it goes far inland; and it is very probable that its habits differ greatly in different localities.

HARLEQUIN DUCK, *Anas histrionica*, Wils. Amer. Orn., vol. viii. p. 139.
FULIGULA HISTRIONICA, Bonap. Syn., p. 394.
CLANGULA HISTRIONICA, *Harlequin Duck*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 459.
HARLEQUIN DUCK, *Fuligula histrionica*, Aud. Orn. Biog., vol. iii. p. 612; vol. v. p. 617.

Adult Male in summer.

Bill much shorter than the head, comparatively narrow, deeper than broad at the base, slightly depressed towards the end, which is rounded. Upper mandible with the dorsal line straight and sloping to the middle, then nearly straight, towards the tip decurved, the ridge broad and flat at the base, convex towards the end, the sides convex, the edges soft, with about thirty-five oblique internal lamellæ, the unguis large and elliptical. Nostrils sub-basal, elliptical, very large, pervious, nearer the ridge than the edge. Lower mandible flat, with the angle long, rather narrow, rounded, the dorsal line slightly convex, the edges with about forty lamellæ, the unguis elliptical.

Head rather large, compressed. Eyes of moderate size. Neck of ordinary length, thick. Body large, depressed. Wings rather small. Feet very short, placed rather far behind; tarsus very short, compressed, having anteriorly in its whole length a series of small scutella, and above the outer toe a few broad scales, the rest covered with reticular angular scales. Hind toe very small, with a free membrane beneath; anterior toes longer than the tarsus, connected by reticulated membranes, having a sinus on their free margins, the inner with a narrow lobed marginal membrane, the outer with a thickened edge, the third and fourth about equal and longest, all covered above with narrow scutella. Claws small, arched, obtuse, that of first toe very small, of third largest, and with an inner thin edge.

Plumage dense, soft, blended. Feathers on the fore part of the head very small and rounded, on the upper part of the head slightly elongated, on the neck narrow, on the other parts broad and rounded. Wings rather short, narrow, pointed; primary quills curved, strong, tapering, and pointed, the first and second about equal, and longest, the rest rapidly graduated; secon-

dary short, broad, and rounded. Tail very short, cuneate, of sixteen strong tapering feathers.

Bill light yellowish-olive, the tips of the unguis lighter. Iris reddish-brown. Feet light blue, the webs greyish-black, the claws whitish. A broad band from the base of the bill to the occiput bluish-black, margined behind with light yellowish-red, before with white, that colour forming a broad triangular spot on the cheek anterior to the eye. Sides of the head, and neck all round, purplish-blue; a spot of white behind the ear, a curved line on the side of the neck, a complete ring of white below the middle of the neck, with a curved band of the same colour anterior to the wing. All these white markings broadly edged with deep black. The fore part of the back light purplish-blue, the hind part gradually deepening in tint, so as to become almost black, of which colour is the rump all round. Scapulars chiefly white; wing-coverts purplish-blue, as are the alula and primary coverts, the quills dark greyish-brown, the tail greyish-black, a small white spot near the flexure of the wing; a band of white across the wing, formed by the tips of the secondaries of which the inner have their outer webs principally of the same colour. Fore part of the breast purplish-blue, hind part and abdomen greyish-brown, sides light red; a lateral spot of white near the root of the tail.

Length to end of tail 17¼ inches, to end of wings 14½, to end of claws 16½; extent of wings 26½; wing from flexure 7¾; tail 3½; bill along the back $1\frac{1}{12}$, along the edge of lower mandible 1½; tarsus $1\frac{5}{12}$; middle toe 2, its claw $\frac{4}{12}$. Weight 1½ lbs.

Male in the second year.

The young male, after the first moult, is greyish-brown on the back and wings, light brownish-grey beneath. The head and neck are of a dull leaden-blue, the upper part of the head darker. The white spot before the eye is mottled with grey, the line extending over the eye obscure, and the edging of the occiput faint reddish-brown. The two white marks exist on the sides of the neck, but are merely edged with darker blue; there are slight indications of the white collar, and the band before the wing is marked, but much smaller than in the adult. The quills are dark brown, but the secondaries are not tipped with white, of which there are but slight indications on the scapulars. The upper tail-coverts are blackish, the tail bluish-grey, lighter at the end. The bill is dusky, the feet of a leaden tint.

Male in the third year.

After the second moult, the male has greatly improved in colouring, although the tints are not nearly so pure as in the old bird. The hind part of the back is still brown, as are the wing-coverts; the sides are dark brownish-grey, with undulated yellowish-red bars. The white collar is not yet

complete, but all the white markings on the neck are edged with black; the fore part of the breast is dull grey, the middle yellowish-grey, spotted with bluish-grey. The white bar on the wing is still wanting; the rump is glossy bluish-black, the tail nearly of the same tint.

Adult Female.

The principal colour of the female is greyish-brown, deeper on the head and rump, lighter on the fore neck, and mottled with greyish-white on the breast. The quills are dark brown, edged with lighter, the tail blackish-grey. There is a large whitish spot mottled with grey before the eye, and another of a purer white behind the ear. Bill and feet dull bluish-grey. Iris brown.

Length to end of tail 16 inches, to end of wings 13½, to end of claws 15½; extent of wings 24¼; wings from flexure 8¾; tail 3½; bill along the back 1$\frac{6}{12}$, along the edge of lower mandible 1½; tarsus 1¾; middle toe 2, its claw $\frac{4}{12}$. Weight 1¾ lbs.

Male from Dr. T. M. BREWER. Width of mouth 9 twelfths, its roof deeply concave as in most other Ducks; the posterior aperture of the nares oblongo-linear, 8 twelfths in length, margined with very slender acute papillæ; the lamellæ on each side of the upper mandible about 35; those on the edge of the lower mandible about 60; the tongue 1 inch 4 twelfths long, fleshy, broad, thick at the base, becoming thin toward the end, with thin, fringed margins, and a semicircular tip. Œsophagus 7 inches 2 twelfths long, of the uniform width of 8 twelfths on the neck, the proventriculus 9 twelfths in breadth. Stomach a strong muscular gizzard, 1¾ inches long, 1 inch 7 twelfths broad; the lateral muscles very large, the tendons covering almost its whole surface; the epithelium very thick, dense, with two opposite elliptical flat grinding surfaces. The proventricular glands form a belt 1½ inches in breadth. The liver is very large, its lobes very unequal, the right 2 inches 8 twelfths long, the left 1 inch 8 twelfths. Intestine 58½ inches long, its average width 5 twelfths.

The trachea, which is 6½ inches in length, has at first a breadth of only 3 twelfths, but at the distance of three-quarters of an inch enlarges to 4½ twelfths, and so continues for 2 inches; it then contracts to 2½ twelfths, and again at the lower part enlarges to 5¾ twelfths, and terminates in a large transverse bony dilatation or tympanum, of which the length is 7½ twelfths, the breadth 1 inch 2 twelfths; it projects as usual to the left side, where it is of a rounded form. The rings of the trachea are 124, broad, firm, and well ossified. The bronchi are of moderate width, of about 25 half rings. The lateral muscles are strong, the sterno-tracheal of considerable size, coming off at the commencement of the tympanum, and there are no inferior laryngeal muscles.

In a female, the intestine is 57 inches long; its width in the duodenal part 3 twelfths; the cœca 4 inches long, 3 twelfths in breadth at the widest part, at the base 1 twelfth, and toward the end 2 twelfths; their distance from the extremity 3 inches.

LONG-TAILED DUCK.

FULIGULA GLACIALIS, *Linn.*

PLATE CCCCX.—MALES, FEMALE, AND UNFLEDGED YOUNG.

In the course of one of my rambles along the borders of a large fresh-water lake, near Bras-d'or, in Labrador, on the 28th of July, 1833, I was delighted by the sight of several young broods of this species of Duck, all carefully attended to by their anxious and watchful mothers. Not a male bird was on the lake, which was fully two miles distant from the sea, and I concluded that in this species, as in many others, the males abandon the females after incubation has commenced. I watched their motions a good while, searching at the same time for the nests, one of which I was not long in discovering. Although it was quite destitute of anything bearing the appearance of life, it still contained the down which the mother had plucked from herself for the purpose of keeping her eggs warm. It was placed under an alder bush, among rank weeds, not more than eight or nine feet from the edge of the water, and was formed of rather coarse grass, with an upper layer of finer weeds, which were neatly arranged, while the down filled the bottom of the cavity, now apparently flattened by the long sitting of the bird. The number of young broods in sight induced me to search for more nests, and in about an hour I discovered six more, in one of which I was delighted to find two rotten eggs. They measured 2 inches and $\frac{1}{8}$ long, by $1\frac{1}{8}$ broad, were of a uniform pale yellowish-green, and quite smooth.

My young companions had, unfortunately for me, walked that morning to Blanc Sablon, about thirty miles distant, down the Straits of Belle Isle; and having no dog to assist me in procuring some of the Young Ducks, I was obliged to enact the part of one myself, although the thermometer that day was 45° 50′, and the atmosphere felt chilly. I gave chase to the younglings, which made for different parts of the shore, as I followed them up to my

3.

Long-tailed Duck

1. Male. Summer Plumage, 2. Male in Winter 3. Female and Young.

Drawn from Nature by J.J Audubon F.R.S.F.L.S.

Lith.ed Printed & Col.d by J.T Bowen, Phila.a

middle in the water, while they dived before me like so many Water witches, the mothers keeping aloof, and sounding their notes of alarm and admonition. I was fortunate enough to procure several of the young birds, and afterwards shot one of the old, which having young much smaller than the rest, was more anxious for their safety, and kept with them within shot. She and the young were afterwards put in rum, to be subsequently examined. I counted eleven broods on the same pond, and Mr. JONES assured me that these birds always breed in numbers together, but rarely on the same lake two successive years. Their plumage was ragged, in so far as I could judge, and the individual which I shot was similar. They never dived while in my sight, but seemed constantly to urge their young to do so, and the little things so profited by the advice of their parents, that had they remained in the water, instead of making, after awhile, for the land, I believe I should not have succeeded, after all my exertions, in capturing a single one of them.

The gentleman above mentioned informed me that the old birds keep the young in the ponds until they are quite able to fly, or until the end of August, when the flocks remove on wing to the sea, and soon after leave the coast, seldom reappearing before the first days of May, or about two weeks before most other kinds of Ducks. The little ones which I procured, were as you see them represented in my plate. Those that were larger were of the same colour, and none showed any feathers on their bodies. Now and then, like all other young Ducks, they would skim over the surface of the water with astonishing rapidity, emitting a sharp note somewhat resembling the syllables *pee, pee, pee*, and would then dive with the quickness of thought. When squatted among the moss, they allowed me to take them without making any attempt to escape. The young were put in a tub, and had some soaked biscuit placed near them; but they were all found dead the next morning.

The range of this noisy, lively, and beautiful Duck, extends along our coast as far south as Texas, and it is also found at the mouth of the Columbia river; but the species is never found on any of our fresh-water courses, and I am quite confident that Mr. SAY mistook for it the Pintail Duck, *Anas acuta*, when he says that he found it on the waters of the Missouri. During all my residence in the neighbourhood of the Mississippi, and in the course of all my journeys on and along its waters, I never saw one of these birds, or heard of any having occurred on that stream above its confluence with the Gulf of Mexico; whereas the Pintails are extremely abundant there, as well as on the Missouri, the Ohio, and all our western streams, in spring and autumn. Few Long-tailed Ducks are to be seen in the market of New

Orleans, and in fact they are altogether what our gunners usually call "sea ducks."

The period of the first appearance of this species in autumn depends much on the state of the weather. I have known a difference of a whole month in the Sound, and quite as much in Chesapeake Bay, in both of which it is most abundant in winter, rarely proceeding farther south until driven away by extreme cold. Their advance from Labrador and Newfoundland along the coast, until they reach Long Island, is more hurried than afterwards. They arrive in small flocks, which are soon joined by others, and as they are prone to congregate, vast numbers are seen together in winter, when their cacklings, though different from those of our frogs in spring, are almost as incessant from sunset until dawn. For my part, I have never perceived any resemblance which their notes bear to the words "south-southerly," but think their noisy cries as duckish as those of the Mallard, although sharper and more musical. The best imitation is given by my friend NUTTALL, but if you attempt to reduce the syllables to sounds, there is some probability of your at least succeeding in exciting laughter in yourself or others. He says the notes are "ogh, ough, egh," and again "ogh, ogh, ogh, ough, egh," and adds that they are guttural, and have a ludicrous drawling tone. Dr. RICHARDSON informs us that "the peculiar cry of this Duck is celebrated in the songs of the Canadian voyagers." This to my mind would imply that the Long-tailed Ducks are seen by these adventurous travellers on the waters of the inland streams, which would appear to be at variance with their usual habits, for unless during the breeding season, they give a decided preference to the sea; and indeed generally keep in deep water. Owing to their reiterated cries these birds are named "Noisy Ducks;" but they have various appellations, among others those of "Old Wives," and "Old Squaws."

Although, like all sea-ducks, the "Old Wife" swims deeply, it moves with a grace and celerity, which, if not superior to those of any of its tribe, are at least equal; and when the weather is rough, and the waters agitated, it raises its tail in the same manner as the Ruddy Duck and Pintail. When advancing in smooth water, its speed is such as to cause a considerable swell before it, such as sea-faring persons usually call a "bone." Like all others of its tribe, it also prefers swimming against both wind and tide, as then it can sooner take wing if necessary. In calm and pleasant weather, like its congeners, it is fond of throwing its body almost over, and of pluming itself in that position. When on wing, the long feathers of its tail do not seem to aid its progress, any more than in other species.

It seldom removes from the north on its way to our Middle Districts in large flocks; but at the approach of the breeding season, and after the birds

appear to be all paired, they fly northward in long lines, or broad fronts, moving high or low according to the state of the weather, passing at times at a considerable distance from the shores, but flying close to the points of every cape, although they never pass over an isthmus, however narrow. Their flight is swift, well sustained, and accompanied with a well-marked whistling of their wings. Being expert divers, it is difficult to kill them on the water; and if you happen to wound one but slightly, I would advise you, reader, to give up the chase, unless you have hit it while on the ice, in which case you will find that it runs rather awkwardly. Their flesh is none of the best, being dark, generally tough, and to the taste fishy; for which reason they are now-a-days frequently brought to our markets plucked, with the head and feet cut off, and called by the venders by all names excepting old wives, squaws, noisy ducks, or south-southerlies. The food of this species consists chiefly of shell-fish; but in the stomachs of those killed on fresh water in Labrador, I found small fishes, and a quantity of grass and its roots.

From the great number of specimens which I have procured in our Middle Districts in winter, and those which I have seen killed during the love season in the north, I am induced to think that the elongated feathers of the tail of this species scarcely, if at all, differ in length at these different periods, although some writers have said that in spring they are much longer than in winter, in which latter season, however, I think the old males differ only in the colour of their plumage from their state in spring. I have obtained male specimens at New York and at Baltimore early in March, when they were already much changed from their appearance in winter; but my friend BACHMAN informs me that he has never seen one with any appearance of the summer plumage at Charleston in South Carolina, where, however, he adds, this species is not common.

I have represented two male birds, one in its full spring dress, the other in that of winter. You will also find in the same plate the first figure ever given of an adult female, accompanied with as many younglings as I could conveniently introduce. WILSON gave the figure of a young male in the first winter as that of a female.

LONG-TAILED DUCK, *Anas glacialis*, Wils. Amer. Orn., vol. viii. p. 93.
FULIGULA GLACIALIS, Bonap. Syn., p. 395.
LONG-TAILED DUCK, *Harelda glacialis*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 460.
LONG-TAILED DUCK, Nutt. Man., vol. ii. p. 453.
LONG-TAILED DUCK, *Fuligula glacialis*, Aud. Orn. Biog., vol. iv. p. 103.

Male, 23, 29½. Female, 15½, 26.

Breeds from Labrador northward to the Arctic Seas. Abundant during

winter along the coasts of the Atlantic Districts to the mouth of the Mississippi. Never in the interior.

Adult Male in summer.

Bill shorter than the head, higher than broad at the base, gradually depressed toward the end, the sides nearly parallel, the tip rounded. Upper mandible with the basal angles inconspicuous, the dorsal line descending and straight to the unguis, then convex and decurved, the ridge broad and flattened at the base, convex toward the end, the sides sloping and convex, the unguis roundish, the edges membranous, very narrow at the base, enlarged towards the end, with about thirty lamellæ ending in a projecting point. Nostrils sub-basal, oblong, direct, large, pervious, near the ridge, in an oblong groove with a soft membrane. Lower mandible flat, a little curved upwards, the angle very long and narrow, the unguis broad and rounded, the erect edges with about forty direct lamellæ.

Head oblong, compressed, of moderate size. Eyes of moderate size. Neck rather short. Body compact, rather elongated, and somewhat depressed. Feet short, stout, placed rather far behind; tarsus very short, compressed, anteriorly with a series of small scutella, externally of which are five in a line with the outer toe, the rest reticulated with angular scales. Hind toe very small, with a free membrane beneath; outer toe, which is the longest, almost double the length of the tarsus, middle toe scarcely shorter than outer; anterior toes with numerous narrow scutella, webbed, the margin of the webs concave; inner toe with a two-lobed expanded margin. Claws small, slightly arched, blunt.

Plumage dense, blended, elastic, stiffish; but soft and glossy on the head; the feathers broad and slightly rounded at the end. Scapulars elongated, acuminate, the posterior decurved over the wing. Wings shortish, narrow, pointed; primary quills curved, strong, tapering, the second longest, exceeding the first by about one twelfth of an inch, the rest rapidly decreasing; secondaries broad and rounded, the inner elongated and pointed. Tail of fourteen pointed feathers, the outer very short, the middle extremely attenuated and slightly recurved, the intermediate proportional.

Bill black in its basal half, orange-yellow towards the end, the unguis bluish-grey. Iris bright carmine. Feet light bluish-grey, the webs dusky, claws black. A large oblong greyish-white patch on each side of the head from the bill to behind the ear; the upper part of the head and nape black, that colour being narrowed in front by the encroachment of the white patches. The neck all round, and anterior half of the breast, of a rich dark chocolate-brown; the back and wing-coverts brownish-black; the scapulars broadly margined with light reddish-brown; the quills are of the same chocolate tint as the breast, the secondaries margined externally with lighter,

the primaries internally. The middle four feathers of the tail brownish-black, the outer two of these slightly margined with white, all the rest white, but the inner with a longitudinal dusky patch on the outer web.

Length to end of tail 23 inches, to end of wings 15, to end of claws 17; extent of wings 29½; wing from flexure 9½; middle tail-feathers 10, lateral tail-feathers 2½; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible $1\frac{8}{12}$; tarsus $1\frac{2}{12}$; outer toe and claw $3\frac{3}{12}$, middle toe and claw $1\frac{3}{12}$, hind toe and claw $\frac{7}{12}$.

Female in summer.

The female is somewhat less than the male, and differs not only in colour, but in the scapulars, which are not elongated, and in the tail, which is short and rounded. The bill and feet are dusky-green, the iris yellow. The head is dark greyish-brown, with a patch of greyish-white surrounding the eye, but not extending to the bill; there is a larger patch of the same colour on the side of the neck, the hind part of which is similar to the head, the fore part greyish-brown, the feathers broadly margined with whitish. All the upper parts are of a dark greyish-brown, the two lateral tail-feathers edged with white; the lower parts white, the feathers under the wings slightly tinged with grey.

Length to end of tail 15¾ inches, to end of wings 14½, to end of claws 16½; extent of wings 26½; wing from flexure 8; middle tail-feathers $2\frac{9}{12}$, lateral 2¼; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible $1\frac{3}{12}$.

Adult Male in winter.

The outer half of the bill rich orange-yellow, that colour extending to the base along the ridge, the unguis and the basal half black, as well as the unguis and edges of the lower mandible. The head, neck, and fore part of back and scapulars, white; the space about the eye pale greyish-red, and a large oblong patch of chocolate-brown on the side of the neck. The upper parts, including the four middle tail-feathers, are brownish-black, but the secondary quills tinged with reddish-brown, and having paler margins. The anterior half of the breast chocolate-brown, the rest of the lower parts and the four lateral tail-feathers white.

Unfledged Young.

The young, when newly excluded, are covered with stiffish down. Bill and feet greenish-dusky; the upper parts chocolate-brown; a small spot of white under the eye; throat and lower parts whitish, as well as an oblong patch on the cheeks.

The young male in winter, that is, after its first moult, has the bill and legs dusky-green. The head and half of the neck are whitish; the upper part of the former and a patch on the side of the latter mottled with brownish-black and chocolate. The upper parts brownish-black, variegated with

brownish-red, the still unelongated scapulars chiefly of the latter colour. A broad undefined belt of reddish-brown over the lower fore part of the neck; the rest of the lower parts greyish-white.

Length to end of tail 22 inches; extent of wings 29.

The young female in winter is similar to the adult, but with the upper parts paler, the light-coloured patches on the head and neck more dusky, and the lower parts of a less pure white.

Adult males, assuming the summer plumage, about April, present a curious intermixture of the variously coloured feathers of the two seasons.

In a male bird, the tongue is 1 inch and 5 twelfths long, papillate at the base, fleshy, with two rows of bristles along the edges. There are 35 lamellæ on each side of the upper, and about 40 on the lower mandible. The œsophagus is 7½ inches long, 7 twelfths in diameter at the upper part, towards the lower parts of the neck dilated to 1 inch, and continuing so to the end. The proventriculus is 1 inch 3 twelfths long, its glandules cylindrical and 2 twelfths long. The stomach is a very powerful gizzard, of a roundish form, 1¾ inches in length, 2 inches and 2 twelfths in breadth; its tendons large; the right muscle 10 twelfths, the left 11 twelfths in thickness. The cuticular lining is thick, and slightly rugous; the grinding plates thicker and denser. The contents of the stomach are small muscles and particles of quartz, some of which are 3 twelfths in diameter. The intestine is 5 feet 6 inches long, its diameter nearly uniform, about 4 twelfths; the rectum enlarged to 5 twelfths, its length 2½ inches. Cœca 4¾ inches long, 3 twelfths in diameter, their extremity rounded; the cloaca globular, about 9 twelfths in diameter.

The trachea, moderately extended, measures 6 inches in length, its breadth at the top 5 twelfths, about the middle 3¾ twelfths. The number of ordinary rings is 72; at the lower part there are 6 expanded rings which are broad posteriorly and on the sides, but extremely narrow before; beyond this is a solid bony expansion of 7 united rings, forming anteriorly a transversely oblong case, having a membrane in front. The contractor muscles are very large, for two inches at the top expanded over the fore part, sending off two cleido-tracheals, then passing down along the edges of the six enlarged rings, and terminating on the drum, where the sterno-tracheals come off.

FAMILY XL.—MERGINÆ. MERGANSERS.

Bill rather long, straight, rather slender but strong, tapering, higher than broad at the base, nearly cylindrical toward the end; upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge broad and flattened at the base, then convex, the sides sloping, toward the end convex, the edges serrate internally with oblique dentiform lamellæ, the unguis oblong, much curved, abruptly rounded at the end; nasal groove elongated, covered by the soft skin of the bill; lower mandible with the angle very narrow and extended to the unguis, which is obovate, the sides nearly erect, with a long narrow groove, the edges internally serrate, the unguis convex, thick-edged. Head rather large, compressed, oblong; neck of moderate length; body full, depressed, rather elongated. Feet placed far behind, stout; tibia bare for a short space; tarsus very short, compressed, anteriorly covered with small scutella, and another series on the lower half externally. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus, second shorter than the fourth, which is almost as long as the third, all scutellate, and connected by anteriorly concave webs. Claws rather small, moderately arched, compressed, acute. Plumage moderately full, dense, soft, glossy, blended beneath. Wings of moderate breadth, convex, acute; inner secondaries elongated and tapering. Tail short, much rounded, of more than twelve feathers. Upper mandible with an internal series of small papillæ or laminæ on each side, besides those on the margin. Tongue long, fleshy, emarginate and papillate at the base, tapering, with a double row of slender reversed papillæ along the upper surface, and two lateral series of filaments on each side, the tip lacerated; œsophagus very wide, of nearly uniform diameter; stomach a strong gizzard of moderate or small size, with the lateral muscles thick; the epithelium dense and longitudinally rugous; intestine long, rather narrow; cœca rather long; cloaca globular. Trachea with one or two extensive dilatations, besides the enormously developed tympanum at the bifurcation; no inferior laryngeal muscles. Nest on the ground, or in hollow trees. Eggs numerous.

Genus I.—MERGUS, *Linn.* MERGANSER.

Character as above.

BUFF-BREASTED MERGANSER, OR GOOSANDER.

MERGUS MERGANSER, *Linn.*

PLATE CCCCXI.—MALE AND FEMALE.

This species may be said to be a constant resident with us, as many individuals breed in the interior of the states of New York, Massachusetts, and Maine. When I first resided in Kentucky, some bred there also, although at the present day none pass the summer in that country. In the latter part of autumn, in winter, and in early spring, they are found in all parts of the Union; in Texas I procured some in April, 1837, and in the beginning of May saw a considerable flock in Galveston Bay. How much farther southward their migrations extend I know not, but from having observed them coming from that direction, I suspect that they advance pretty far into the interior of Mexico, from which some perhaps cross to the Arkansas river, on which I have also seen them. On the Mississippi, the Ohio, and their tributaries, Goosanders are found during the coldest weather; and when the larger streams are covered with ice, they betake themselves to such smaller creeks as have very rapid currents or cascades, about which they feed. But there are parts of our southern coast, where they are exceedingly rare, such as South Carolina, where my friend Dr. BACHMAN has never seen one, and the Floridas, in which none occurred to me during my rambles there. Indeed one is surprised to find that among birds like this, which is so hardy as to remain in our North-eastern States during the severest part of the winter, some should extend their movements at the same season as far to the south-west as Texas; but facts like these are beyond our philosophy. In the lower parts of Louisiana, this species is called the "Bec-scie-de-mer," probably because there it is found only on the large salt-water lakes, and about the mouths of the Mississippi, and to distinguish it from the Hooded Merganser, which there is more usually seen on fresh water. I have been assured by Professor MACCULLOCH of Pictou that it now and then breeds in Nova Scotia. Yet I found none in Labrador or Newfoundland, where the Red-breasted species was breeding in great numbers. Dr. RICHARDSON found it in abundance in the Fur Countries.

The Goosander is a vigorous and robust bird. It swims deeply, but with considerable speed, even against a strong current, running waters being

Buff-breasted Merganser Goosander

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S. 1. Male. 2. Female. Lith. Printed & Col.d by J.T. Bowen, Phila.d.

generally preferred by it, even when rather shallow, provided their beds are of sand or pebbles, for it is rarely seen on muddy or stagnant waters, even during the breeding season, when it returns to the inland lakes. Like the Grebes it has the power of sinking backwards, and it dives expertly, remaining occasionally several minutes beneath the surface. It usually swims and dives against the current, and close by the shores, extricating itself from floating ice by passing under it. Its voracity is great, so that it consumes an extraordinary quantity of fish. I have found fishes in its stomach seven inches in length, and of smaller kinds so many as to weigh more than half a pound. Digestion takes place with great rapidity, insomuch that some which I have fed in captivity devoured more than two dozen of fishes about four inches in length, four times daily, and yet always seemed to be desirous of more. The alleged awkwardness of this bird when on shore is a fable, for I have seen individuals while courting in spring run with great celerity fifty or more yards at a time, keeping nearly in an erect position. On occasions of this kind I have observed on the sand-bars of the Mississippi flocks of seven or eight males chasing each other with great animosity. At other times, however, they are not fond of walking much, but when on shore are generally seen lying flat on the ground. At times the Mergansers rise almost at once on wing from the water, but at others they seem to find considerable difficulty, patting it with their feet for many yards. These differences seem to depend on various circumstances, such as their being suddenly surprised, or during violent winds. They generally, if not always, rise on wing against the breeze.

The flight of the Goosander is powerful, and as rapid and sustained as that of the Red-breasted and Hooded Mergansers. When fairly under way and at a good height, they advance in an almost direct course and proceed with surprising velocity, so that, when suddenly apprised of the vicinity of man they at times find it difficult to check their speed so quickly as may be necessary for their safety. I well remember that on several occasions having watched one of these birds flying directly up a creek and towards me, I have taken aim at it and fired when it was at the proper distance, and yet such had been its velocity that it would advance, after being shot, many yards towards me. When rising from the water, whatever number may be in the flock, they all start together, paddle off with their feet and wings, stretching out their necks, and thus run as it were on the water to the distance of twenty or thirty yards with great velocity, extending in a front, or following each other in a line, according to the extent of the space before them. They then gradually ascend to the height of the trees, and move off to some considerable distance, but often return to the same place. They seem to ascertain the fertility of the waters by sipping a little on their

alighting. and then, having found appearances favourable, they open their bills, apparently to take a deep inspiration, and immediately dive. When they have procured a sufficiency of food, they betake themselves to some sand-bar, on which they repose until it is digested.

The Goosander rises to the surface with the fish in its bill, and, shifting it about until it is in a proper position, swallows it head-foremost, then dives for more. So deeply does it swim, that on such occasions not more than a third of its body is seen on the surface; and there is very little chance of shooting it, for it dives on seeing the flash, or even on hearing the click of the lock. The only chance of procuring one at such times is when, on coming to the surface, it stretches itself up and beats its wings. If it is only wounded, it often exhibits great tenacity of life, and diving at once, remains a long time in the water. On emerging, it is seen shaking its head violently, for the purpose of disgorging its food, and, perhaps, the blood that has flowed into its lungs; and, on effecting this, it again plunges headlong. At length, you see it come to the surface, with its beautifully tinged breast upwards; but if your object be to obtain game, you will have little satisfaction in procuring a Goosander or any of its genus, for they are all fishy, oily, tough, and fitted for the palate of none but experienced epicures. The food of the Goosander consists chiefly of fish, but also of bivalve shells, snails, leeches, aquatic lizards, crays, and frogs.

Now, good reader, spring has once more gladdened the face of nature, pearly drops hang on every leaf, glistening in the bright sunshine, and thousands of gay insects flutter around. My light canoe is ready. Leap in, seat yourself snugly in the bow, and sit still while I paddle you to the green islands of this beautiful lake, where we shall probably find a Merganser or two, perhaps a female sitting on her eggs. As to the dog, we need him not; so lie thee down, Baron, until I return. I was always fond of "paddling my own canoe," and I never met with a single accident so long as I managed it myself; but on more occasions than one I have been turned out as gently as one turns himself in bed, and having put the frail bark to rights, have assisted the awkward fellow who had caused the disaster, dived for his gun and my own, and conducted him to the camp to dry his garments. Therefore, be quiet, and fear nothing. How smooth and silvery are the pure waters, how beautiful those tall trees! The dogwood is in full bloom, so are the maples, whose rich red blossoms cluster on the twigs. Here we are just entering the rushes of this little island. Get out, and wade to the shore with all possible gentleness; or allow me to do so; for to lighten our slight bark, one of us must get into the water. Softly we advance as I pull the canoe by the bow; but now, squat, for here are tracks of the Goosander. There now lies the female close before us. She thinks we have not seen her, for

she crouches closer upon her eggs. Alarm her not, or she will soon depart. There she croaks, and scrambling off through the tall grass, flies off on rapid wings. Look at the nest! count the eggs if you choose, but allow me, if you please, to describe them.

The islands on which the Goosander is wont to breed are mostly small, as if selected for the purpose of allowing the sitting bird to get soon to the water in case of danger. The nest is very large, at times raised seven or eight inches on the top of a bed of all the dead weeds which the bird can gather in the neighbourhood. Properly speaking, the real nest, however, is not larger than that of the Dusky Duck, and is rather neatly formed externally of fibrous roots, and lined round the edges with the down of the bird. The interior is about seven and a half inches in diameter, and four inches in depth. There are seldom more than seven or eight eggs, which measure two inches and seven-eighths in length, by two inches in breadth, are of an elliptical form, being nearly equally rounded at both ends, smooth, and of a uniform dull cream-colour. The young are led to the water in a few hours after they are hatched, and are covered with fur-like hair, of a reddish-brown colour about the head and neck, the body lightish grey. They are excellent divers, and run on the surface with surprising velocity; but they are not able to fly for nearly two months, when, being fat, they are easily fatigued if closely pursued, and on such occasions will often betake themselves to the shore, lie down, and even allow you to lay hold of them. My friend THOMAS NUTTALL has given an interesting account of his chase of a brood of Goosanders.

"Early in the month of May, 1832, while descending the Susquehanna near to Dunstown, a few miles below the gorge of the Alleghanies, through which that river meanders near the foot of the Bald Eagle Mountain, G. LYMAN, Esq., and myself observed, near the head of a little bushy island, some Wild Duck, as we thought, with her brood making off round a point which closed the view. On rowing to the spot, the wily parent had still continued her retreat, and we gave chase to the party, which with all the exertions that could be made in rowing, still kept at a respectful distance before us. We now perceived that these diminutive possessors of their natal island were a female Goosander or Dun Diver, with a small but active little brood of eight young ones. On pushing the chase for near half an hour, the young, becoming somewhat fatigued, drew around their natural protector, who now and then bore them along crowding on her back. At length, stealing nearly from our sight, as the chase relaxed, the mother landed at a distance on the gravelly shore, which being nearly of her own grey colour and that of her family, served for some time as a complete concealment. When approached again, however, they took to the water, and after a second

attempt, in which the young strove to escape by repeated divings, we succeeded in cutting off the retreat of one of the family, which was at length taken from behind a flat boat under which it had finally retreated to hide. We now examined the little stranger, and found it to be a young Merganser of this species, not bigger than the egg of a Goose, and yet already a most elegant epitome of its female parent, generally grey, with the rufous head and neck, and the rudiments of a growing crest. After suffering itself to be examined with great calmness, and without any apparent fear, we restored it to its more natural element, and, at the first effort, this little diminutive of its species flew under the water like an arrow, and coming out to the surface only at considerable distances, we soon lost sight of it, making good its aquatic retreat in quest of the parent. On inquiry, we learned from the tavern-keeper, that for several years past a nest or brood of these birds had annually been seen near this solitary and secluded island."

The male Goosanders leave the females immediately after incubation has commenced, and are then seen in the wildest parts of the country. Several females are often found breeding on the same island, and it is after their young are pretty well grown, that they moult. For a number of years past, I have sometimes entertained a hope, at the approach of the breeding season, of finding a male Goosander having his head adorned with a broad erectile crest, like that of the female and young, but I have hitherto been disappointed, and am therefore unable to say whether such a crest ever exists in that sex. The young of both sexes retain the colouring of the female for two years, during which time the males can be distinguished from the females only by their being much larger. The males have not the rich buffy tint on the breast until about two years after they have commenced breeding, and the first perceptible change by which their sex is distinguished is the appearance of black feathers on the head and neck. Until of late years, the females were thought to be of a distinct species, to which the name of Dun Diver was given.

Many writers have said that this bird breeds in the hollows of trees, or on their branches; but of the various nests which I have found, not one occurred in such situations; and the Hooded Merganser is the only species of this genus which I have observed nestling in an elevated place.

The notes of the Goosander are harsh, consisting of hoarse croaks, seldom uttered unless the bird be suddenly startled, or when courting. The females are usually silent, but when with their young brood, and pursued, they emit the same guttural sounds as the males. Goosanders are easily caught with hooks baited with fish; my friend JOHN BACHMAN has procured them in this manner on the Hudson River, and I also have on the Ohio.

Along with the representation of a pair of adult birds of this species, I have given a correct view of the Cohoes Falls, in the State of New York.

Goosander, *Mergus Merganser*, Wils. Amer. Orn., vol. viii. p. 68.
Mergus Merganser, Bonap. Syn., p. 397.
Mergus Merganser, *Goosander*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 461.
Goosander, *Mergus Merganser*, Nutt. Man., vol. ii. p. 460.
Goosander, *Mergus Merganser*, Aud. Orn. Biog., vol. iv. p. 261.

Male, 27, 36. Female, 24, 34.

In winter dispersed over the United States, and westward as far as Texas. Breeds from Massachusetts northward, and along the Great Lakes.

Adult Male.

Bill about the length of the head, straight, strong, tapering, higher than broad at the base, nearly cylindrical toward the end. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge broad at the base, then convex; the sides sloping rapidly at the base, convex toward the end; the edges serrated beneath; the unguis oblong, much curved, abruptly rounded at the end. Nasal groove elongated; nostrils submedial, linear, direct, pervious. Lower mandible with the angle very narrow, and extended to the unguis, which is obovate; the sides nearly erect in their outer half, with a long narrow groove, the edges serrate within.

Head rather large, compressed, oblong. Neck rather short, thick. Body full, depressed. Feet placed far behind, short, stout; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly covered with small scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus; second shorter than fourth, which is almost as long as the third, all connected by reticulated webs, which are deeply concave; the outer toe slightly margined, the inner with a broad marginal membrane. Claws rather small, moderately arched, compressed, acute, that of the middle toe with a thin inner edge.

Plumage moderately full, dense, soft, glossy. Feathers of the head and neck silky, blended, elongated along the median line, so as to form a not conspicuous crest; of the back rather compact; of the lower parts blended. Wings short, of moderate breadth, convex, acute; primaries narrow, tapering, the first scarcely shorter than the second, the rest rapidly graduated; secondaries rather short, narrow, rounded, the inner elongated and tapering. Tail short, much rounded, of eighteen rather narrow rounded feathers.

Bill bright vermilion, with the unguis black. Iris carmine. Feet orange-red in winter, bright vermilion in the breeding season. Head and upper

half of neck greenish-black, splendent, with bright green reflections; hind part of the neck below white; fore part of neck and all the under parts of a delicate reddish-buff; the sides of the rump and part of the abdomen greyish-white, finely undulated and dotted with dark grey; some of the lower wing-coverts dusky, the larger coverts and primaries light grey. The fore part of the back, and the inner scapulars, glossy black; the hind part ash-grey, becoming lighter and finally undulated on the rump. Upper tail-coverts and tail-feathers deep grey, outer scapulars white; a transverse band of black at the base of the wing, concealed by the scapulars. Wing-coverts white; alula, primary coverts, primary quills, and a band formed by the base of the first row of large coverts, black; secondaries white, six of them margined externally with a black line, the innermost margined on both webs, but more broadly on the inner, and with the tip black.

Length to end of tail 27 inches, to end of claws 26½, to end of wings 24, to carpal joint 13⅝, to end of green on the neck 7¼; extent of wings 36; bill along the ridge $2\frac{8}{12}$, along the edge of lower mandible $3\frac{1}{12}$; wing from flexure 11¼; tail 5; tarsus $1\frac{10}{12}$; first toe and claw $\frac{9}{12}$; outer toe $2\frac{7}{12}$, its claw $\frac{4}{12}$; middle toe $2\frac{8}{12}$, its claw $\frac{5}{12}$. Weight 5 lbs. Of another 3¾ lbs.

Dimensions of two other Males:

Length to end of tail, . .	26	25⅞ inches.
..... claws, . .	27	25
..... wings, . .	24	23½
Extent of wings, . . .	38	35

Female.

The female is much smaller. The bill, eyes, and feet are coloured as in the male, but the ridge of the bill is black, and the nail whitish; the longitudinal crest is much more elongated, being composed of linear feathers, some of them fully two inches and a half long. Head and upper part of neck brownish-red; throat white; all the upper parts, with the sides of the body and rump, deep ash-grey, the feathers paler at the margin. Smaller wing-coverts and inner secondaries grey; bases and tips of secondary coverts black, the intermediate part white; middle secondaries white, outer and primaries black; anterior part of neck below faintly banded with ash-grey; breast and abdomen white, slightly tinged with buff.

Length to end of tail 24 inches, to end of claws 23½, to end of wings 20¾; extent of wings 34; bill along the ridge $1\frac{1}{12}$, along the edge of lower mandible 2½; wing from flexure 10¼; tail 4½; tarsus $1\frac{9}{12}$; hind toe and claw $\frac{6}{12}$; middle toe $2\frac{4}{12}$, its claw $\frac{5}{12}$; outer toe $2\frac{4}{12}$, its claw $\frac{4}{12}$.

The young males after the autumnal moult, and until the middle of summer, resemble the females.

An adult male obtained near Boston examined. The heart is 2 inches

long; the lobes of the liver are nearly equal, the right being 3 inches 7 twelfths long, the left 3 inches 3 twelfths.

The upper mandible has about 28 recurved conical, acute, horny papillæ, and an internal series of smaller, on each side; the tip of the unguis serrulate; on the lower mandible are about 40 of the same nature. The tongue is 2 inches 1 twelfth long, fleshy, emarginate, and papillate at the base, tapering, with a double row of slender reversed papillæ along the upper surface, and two lateral series of filaments on each side; the tip lacerated, horny on the back. Posterior nasal aperture oblong, 10 twelfths in length, papillate on the edges. Aperture of the glottis 4½ twelfths long. The mouth is 10 twelfths in breadth, but may be extended to 1 inch 9 twelfths. The œsophagus is 10½ inches long, its diameter 1 inch 7 twelfths on the neck, contracting to 8 twelfths as it enters the thorax, but again expanding; the external coat of transverse muscular fibres very thick; the internal layer of longitudinal fibres very distinct; the mucous coat thrown into prominent longitudinal plaits when contracted; the mucous follicles disposed in longitudinal single series. The proventriculus is 2 inches long, the glandules very numerous, oblong, about 2 twelfths in length, forming a complete belt. The stomach is a strong gizzard, of moderate size, 2 inches long, the lateral muscles 5 twelfths thick; the epithelium very thick, nearly 1 twelfth, longitudinally rugous. In the stomach and gullet was a fish 9 inches long, the portions lying in the stomach and proventriculus partially dissolved, the rest 4 inches long, not acted upon; there were also two fragments of quartz, one of them a quarter of an inch long. The intestine is long, measuring 6 feet 3 inches, its diameter from 5 to 3 twelfths. The cœca are 3 inches long for half an inch 1½ twelfths in diameter, in the rest of their extent 4 twelfths. The rectum 5 inches long, including the cloaca, which has a diameter of an inch and a quarter.

The trachea, 10½ inches long, has at first a diameter of 4 twelfths, dilates gradually to 8 twelfths, then contracts to 4 twelfths, enlarges a second time to 7 twelfths, and gradually contracts to 3 twelfths. In this space the rings, 146, are strong, broad, and osseous. At its lower part is an enormous dilatation composed of numerous united rings, bulging irregularly on the right side and behind, and on the left expanded into a case having two large spaces filled by membrane; the greatest diameter of this tympanum is 2 inches and 2 twelfths. The bronchi come off at the distance of nearly an inch from each other, and are short, but wide, with about 25 half-rings. The lateral or contractor muscles are very strong, give off a pair of cleido-tracheals from the second enlargement, and at the commencement of the labyrinth the sterno-tracheals, which are also very large; but there are no other inferior laryngeal muscles.

The intestine of a male in the first winter is 6 feet 8 inches long, its greatest diameter half an inch, wider towards the rectum than at the upper part, where the diameter is 4 twelfths. Rectum 4½ inches long, exclusive of the cloaca. Cœca 2¼ inches. Contents of stomach, remains of fishes and a great quantity of quartz fragments.

An adult female. Œsophagus 10¾ inches long; stomach 2 inches long; intestine 5 feet 3 inches; rectum 4½; cœca $2\frac{2}{12}$. The trachea 9 inches long, of uniform diameter, 4 twelfths, with a very slight dilatation toward the lower part, and at the lower larynx contracted to 3 twelfths; the last ring is very large, laterally dilated, but symmetrical; the bronchi come off at the distance of 5 twelfths from each other, and are composed of 25 rings. The tracheal rings 150.

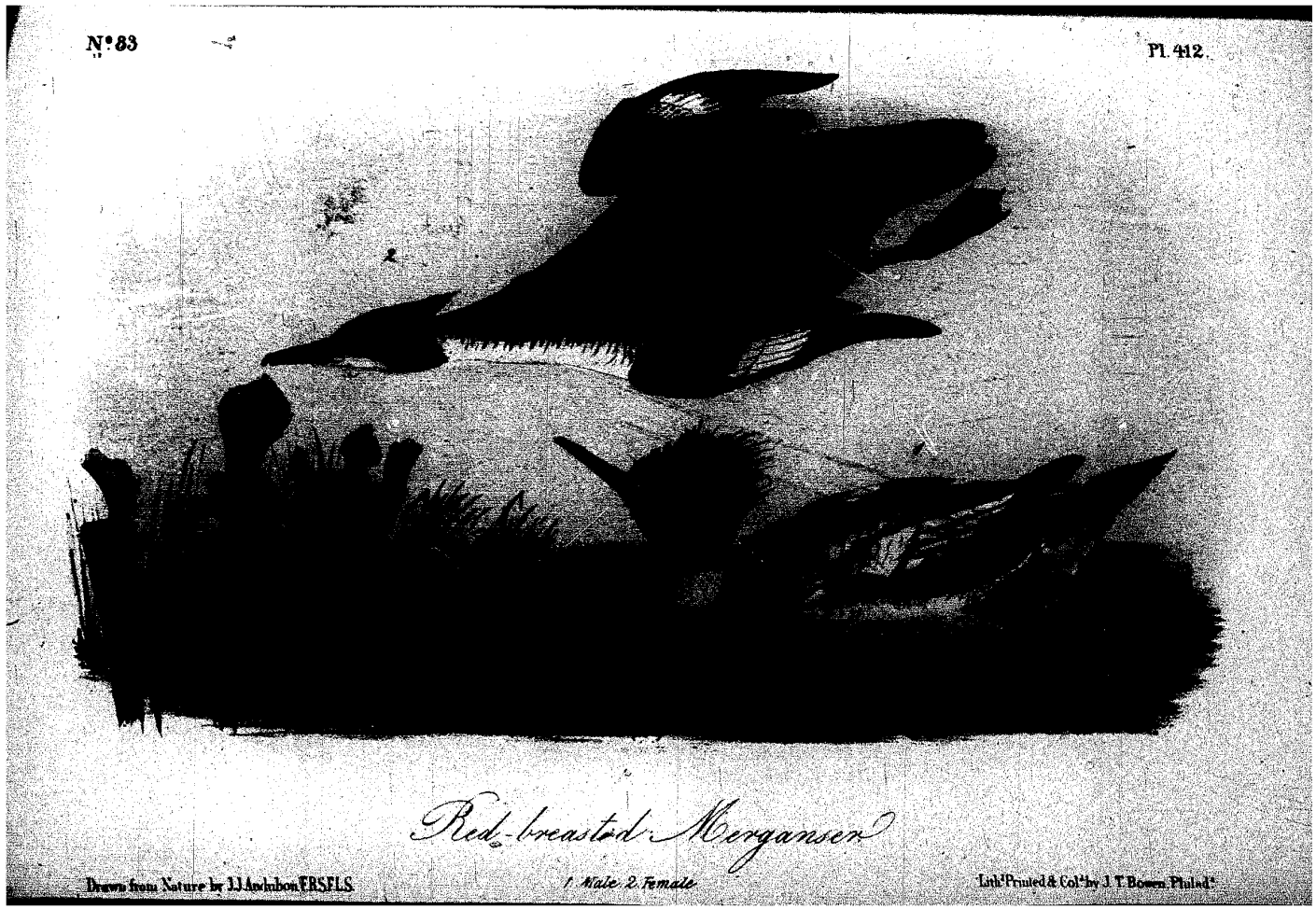
RED-BREASTED MERGANSER.

MERGUS SERRATOR, *Linn.*

PLATE CCCCXII.—MALE AND FEMALE.

The range of the Red-breasted Merganser is of vast extent. In North America I have found it pretty generally dispersed during winter and even to a late period in spring, from Texas to Labrador; and in the Fauna Boreali-Americana Mr. SWAINSON describes a male killed on the Saskatchewan. No date is mentioned, nor is any thing said as to its habits, which would lead me to believe that it must be a rare bird in the Fur Countries. It is found on the western coast, however, and has been shot not far from the mouth of the Columbia river by a gentleman of Boston engaged in the fur-trade, and who is well acquainted with the water-birds of our country. In winter it is to be met with throughout the Union, on almost every unfrozen stream; but when the cold increases so as to close the waters it removes southward until it finds a suitable place.

This species is by choice mostly dependent on fresh water for its sustenance; but when the winters are very severe it throws itself into the salt lagoons or bays, and there seeks for prey to which it is not well accustomed, and which is rather more difficult to be overtaken, than that which is confined in the narrow mountain-streams for which it shews a


N°83
Pl. 412
Red-breasted Merganser
Drawn from Nature by J.J.Audubon F.R.S.F.L.S.
1. Male 2. Female.
Lith.d Printed & Col.d by J. T. Bowen Phila.a

natural predilection greater than even that of the Goosander, *Mergus Merganser*. It breeds in many parts of our Middle and Eastern States, and on two occasions I have found the female in charge of her brood in the lower parts of Kentucky. In the States of New York, Massachusetts, and Maine it is by no means a rare occurrence to meet with the nest of this bird along the borders of small secluded lakes. It is as common at this season in the British provinces of New Brunswick and Nova Scotia, and it is still more plentiful on the islands of the Gulf of St. Lawrence, as well as on the streams of Newfoundland and Labrador.

The Red-breasted Merganser is best known throughout the United States by the name of "Shell-drake." It is, like all the species of its tribe, a most expert diver, and on being fired at with a flint-locked gun generally escapes by disappearing before the shot reaches the place where it has been. Its flight is similar to that of the Goosander, being strong, rapid, and remarkably well sustained when it is travelling to a considerable distance. Gluttonous in the extreme, it frequently gorges itself so as to be unable to rise. I have several times seen one of them obliged to eject a great part of the contents of its stomach and gullet before it could fly off, and some which I have kept a day or two in confinement have died in consequence of swallowing too many fishes.

The "Shell-drake," according to the latitude of the place which it has selected, and the degree of forwardness of the season, begins to form its nest from the first of March until the middle of May. Some nests which I examined in Labrador had not their full complement of eggs until about the 20th of June. In that country, as well as in several parts of the United States, where I have found the nests, they were placed within a very short distance of the margins of fresh-water ponds, among rank grasses and sedges, or beneath the low bushes. The nest bears a great resemblance to that of the Eider Duck, but is a good deal smaller, and better fashioned. It is made of dry weeds and mosses of various kinds, and is warmly lined with down from the breast of the female bird, for the male leaves her as soon as she has completed the laying of the eggs, the number of which I have never found to exceed ten, they being more frequently six or eight. It is a very remarkable fact that the eggs in this family of birds are usually even in number, whereas in most land birds they are odd. The eggs of the Red-breasted Merganser measure two and a half inches in length, an inch and five-eighths in breadth, resemble in form those of the domestic fowl, and are of a uniform plain dull yellowish cream-colour.

When one approaches the nest, the female usually slides or runs off a few paces, and then takes to wing. I have never observed the paths to the nests which some authors have described, and cannot well imagine why there

should be any such, as this bird is capable of taking flight as readily as any with which I am acquainted. It uses the greatest precaution in retiring to the nest; and on more occasions than one I have remained well concealed at a short distance for upwards of an hour before the bird came back to her eggs. Perhaps this may tend to shew that there is less necessity for keeping the eggs warm, even when they are about to be hatched, in this than in other species, which are known to resume incubation as soon as possible.

The young betake themselves to the water a few hours after birth, and are from the first so expert at diving as to be procurable only with great difficulty. Indeed, when they are about a fortnight old, they move with astonishing rapidity, whether on the surface, where they run with almost the speed of a greyhound, or in the water itself, in which they shew themselves as much at home as if they were seals or otters. The only means of catching them that I have found successful is to throw stones at them, whenever they rise, until becoming fatigued, they make for the shore, where they stretch themselves out and remain quite still, so that you may go up to them and take them with the hand.

At the approach of autumn they resemble the old females; but the sexes can easily be distinguished by examining the unguis or extremity of the upper mandible, which will be found to be white or whitish in the males, and red or reddish in the females. The young males begin to assume the spring dress in the beginning of February, but they do not acquire their full size and beauty until the second year.

The Red-breasted Merganser is a shy bird. The males especially are extremely suspicious and vigilant, after they have left the females incubating, and when they congregate in flocks of from five to twenty on some sequestered clear stream, to renew their plumage. The moult is completed in the end of July or beginning of August, and at that season I had the greatest difficulty in procuring them, for, being then almost unable to rise from the water, they seemed to dive with an alertness proportionally greater.

The flesh of this bird is tough, and has a fishy taste. I have represented a male and a female, along with a new species of *Sarracenia*, which is found abundantly from Pensacola to Georgia, as well as in some parts of South Carolina.

RED-BREASTED MERGANSER, *Mergus Serrator*, Wils. Amer. Orn., vol. viii. p. 91.

MERGUS SERRATOR, Bonap. Syn., p. 397.

MERGUS SERRATOR, *Red-breasted Merganser*, Swains. and Rich. F. Bor. Amer., vol ii. p. 462.

RED-BREASTED MERGANSER, Nutt. Man., vol. ii. p. 463.

RED-BREASTED MERGANSER, *Mergus Serrator*, Aud. Orn. Biog., vol. v. p. 92.

Male, 24½, 33. Female, 24, 34½.

From Texas westward to the Columbia river and northward. Common during autumn and spring. Also throughout the United States, and along the Atlantic shores. Breeds from New York to Labrador and the Fur Countries, as well as along the Great Lakes, and on the Rocky Mountains.

Adult Male.

Bill about the length of the head, straight, strong, tapering, higher than broad at the base, nearly cylindrical toward the end. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis suddenly decurved; the ridge flattened at the base, and gradually becoming convex; the sides sloping rapidly at the base, convex toward the end, the edges serrated beneath; the unguis oblong, much curved, abruptly rounded at the end. Nasal groove elongated; nostrils sub-basal, linear, direct, pervious. Lower mandible with the angle very narrow, and extended to the unguis, which is obovate; the sides nearly erect in their outer half, with a long narrow groove, the edges serrate within.

Head rather large, compressed, oblong. Neck rather long and somewhat slender. Body full, depressed. Feet placed far behind, short, stout; tibia bare for about a quarter of an inch; tarsus very short, compressed, anteriorly covered with small scutella, and another row on the lower half externally, the sides reticulated, the hind part thin edged. Hind toe very small, with an inferior free membrane; anterior toes half as long again as the tarsus; second shorter than fourth, which is almost as long as the third, all connected by reticulated webs, which are deeply concave at the margin; the outer toe slightly margined, the inner with a broad marginal membrane. Claws rather small, very slightly arched, compressed, acute, that of the middle toe with a thin inner edge.

Plumage moderately full, dense, soft, glossy. Feathers of the head and upper part of the neck somewhat silky, blended, very narrow, elongated along the median line, so as to form a very conspicuous erectile crest, divided into two parts, those below the upper occipital region and the nape being shorter, leaving two long tufts. Feathers of the back rather compact, of the lower parts blended. Wings short, of moderate breadth, convex, acute; primaries narrow, tapering, the first longest, the second only half a twelfth shorter, the rest rapidly graduated; secondaries rather short, narrow, rounded, the inner elongated and tapering. Tail short, much rounded, of eighteen rounded sub-acuminate feathers.

Bill deep carmine, dusky along the ridge, the unguis yellowish. Iris carmine. Feet bright red, claws greyish-yellow. Head and upper part of neck greenish-black, glossy, with bright green reflections along the sides, and purplish on the crest. On the middle of the neck is a broad ring of white; and on its lower part a broad band of light brownish-red, longitu-

dinally streaked with dusky, each feather being laterally margined with that colour. The lower parts are pure white, excepting the sides of the body and rump, which are transversely undulated with greyish-black, and the larger wing-coverts, which are ash-grey. The fore part of the back, and the inner scapulars, are deep black; the feathers at the shoulder, or anterior to the wing, white, with a broad margin of black; some of the anterior wing-coverts ash-grey; the other small wing-coverts, the outer scapulars, and the terminal half of the secondary coverts, pure white; the basal portion of the latter, the primary coverts, and primary quills, black, the latter tinged with brownish-grey; the secondaries white, with their base and the outer margin of most black, which colour predominates on the inner. The middle and hind part of the back ash-grey, undulated with white and dusky; the tail brownish-grey.

Length to end of tail 24½ inches; to end of wings 22½; to end of claws 25½; extent of wings 33; bill along the ridge $2\frac{3}{12}$; wing from flexure 9½; tail $3\frac{6}{12}$; tarsus $1\frac{7}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{3}{12}$; inner toe $1\frac{10}{12}$, its claw $\frac{4}{12}$; middle toe $2\frac{4}{12}$, its claw $\frac{4}{12}$; outer toe $2\frac{5}{12}$, its claw $\frac{3}{12}$. Weight 2lbs. 8 oz.

Adult Female.

The female, which is of about the same size, differs in having the crest shorter, and in wanting the broad abruptly-terminated feathers anterior to the wing. The bill and feet are of a paler tint; the head and fore part of the neck light reddish-brown, the throat and all the under parts white, excepting the sides of the body and rump, and the larger wing-coverts, which are brownish-grey. The hind neck, back, tail-coverts, tail, scapulars, and wing-coverts are brownish-grey, the feathers margined with paler. The wings are greyish-black, with a large white patch, formed by the terminal portions of the secondary coverts, and the greater part of some of the outer secondaries.

Length to end of tail 24 inches, to end of claws 24¾; extent of wings 34½, bill along the ridge $2\frac{2}{12}$; wing from flexure 9½; tail 3½. Weight 2 lbs. 13 oz.

The young of both sexes when fully fledged resemble the female. The males assume the plumage of the adult at their second moult. When about a fortnight old, the young, such as I found them in Labrador, are entirely covered with soft down, which is dusky reddish-brown on the head and hind neck, greyish-brown on the back, with three white patches on each side, one terminating the wing, another a little behind it, the third, which is larger, behind the leg. The lower parts greyish-white; a white band from the eye to the bill, a reddish-brown band under the eye and along the side of the neck.

An adult male examined. The roof of the mouth is flat, with a median prominent line; the upper mandible with about 35 conical, compressed,

recurved, tooth-like lamellæ on each side ; the lower with about sixty. The aperture of the mouth is dilatable to 1¼ inches, but in its ordinary state measures only 9 twelfths across. The tongue is narrow, tapering, 1 inch 8 twelfths long, with numerous papillæ at the base, and lateral series of recurved bristles. The aperture of the ear, as in all the diving piscivorous birds, is extremely small, being only ¼ twelfth in diameter, and in this respect resembling that of the Seals among the Mammalia. This kind of ear forms the extreme contrast to that of the nocturnal rapacious land birds. In the Ducks and Geese it is also small, but much superior in size to that of the Mergansers. The œsophagus, *a b c d*, is 12 inches long, its diameter at the upper part 1½ inches, farther down 1 inch and 7 twelfths, within the thorax 1 inch 4 twelfths, at the proventriculus 1¼ inches. It is thus extremely wide, like that of other diving piscivorous birds. The stomach, *d e*, is roundish, of moderate size, 1 inch 8 twelfths in length, 1 inch 11 twelfths in breadth. Its lateral muscles are of moderate thickness, its epithelium tough, with two grinding surfaces of a roundish form, and thus resembling that of Ducks. The contents of the stomach are remains of fishes and a great quantity

Fig. 1.

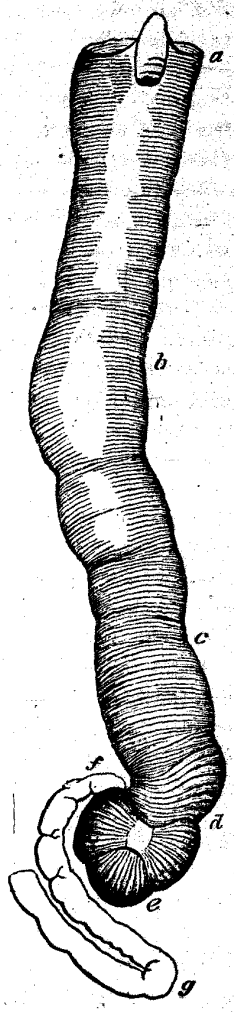
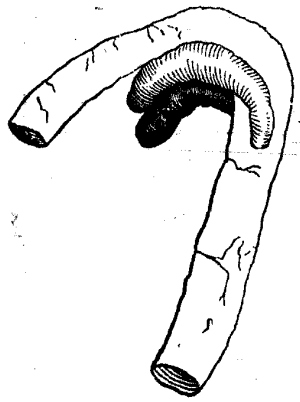


Fig. 2.



of gravel. The inner surface of the œsophagus is very smooth when extended, plicate when contracted, with longitudinal series of mucous crypts with wide apertures, which become more numerous and close toward the proventriculus. The glandules of the latter organ are irregularly distributed, forming a belt 1¼ inches in breadth. They are cylindrical, the largest being ½ inch long, and 1½ twelfths broad. The duodenum, *f g*, has a diameter of 7½ twelfths, but beyond its curve contracts to 3½ twelfths. The intestine is convoluted into numerous folds; its length is 5 feet 2 inches, its diameter about 3 twelfths; but that of the rectum 4½ twelfths. The cœca, Fig. 2, which come off at the distance of 4 inches from the extremity, are 11 twelfths long, 2½ twelfths in their greatest diameter, and obtuse at their extremity.

The trachea is 11½ inches long, and is remarkable for a large dilatation above the middle, 2 inches in length and 11 twelfths in breadth, below which the tube becomes ¼ inch in diameter, afterwards enlarges to 4½ twelfths, then continues 4 twelfths, and ends in an enormous dilatation of an irregular form, of which the greatest diameter is 2 inches. It is composed of a bony frame, with two lateral membranous spaces. The rings of the trachea, 152 in number, are broad and firmly ossified, but about 30 at the lower part are very narrow in their anterior half; about ten are incorporated with the dilatation; the contractor muscles are very large, expand over the sides of the dilated part, and continue downwards, becoming narrower, and ending at the commencement of the tympanum. There is a pair of very large cleído-tracheal muscles, and another of sterno-tracheal; but there are no inferior laryngeal muscles properly so called, the slip from the contractor ending without reaching the last ring. The bronchi come off at the distance of 9 twelfths from each other, and are short, but wide, and composed of about 20 half rings.

In the trachea of a female, which is of a nearly uniform diameter throughout, the number of rings is 150, with 10 united rings, 5 of which extend beyond the bone of divarication, forming the lower larynx, which has no remarkable dilatation. The bronchial half rings are 20.


N° 83.
Pl. 413.
Hooded Merganser.
1. Male. 2. Female.
Drawn from Nature by J.J. Audubon F.R.S.F.L.S.
Lith.d Printed & Col.d by J. T. Bowen Philad.a

THE HOODED MERGANSER.

MERGUS CUCULLATUS, *Linn.*

PLATE CCCCXIII.—MALE AND FEMALE.

Excepting the Smew or White Nun, the Hooded Merganser is the handsomest of its family. Its broad and rounded crest of pure white, with an edging of jetty black, and which it closes or spreads out at pleasure, renders the male of this species conspicuous on the waters to which it resorts. The activity of its motions, the rapidity of its flight, and its other habits, contribute to render it a pleasing object to the student of nature, not less than to the sportsman. Its flesh, however, has a fishy taste and odour, although it is relished by some persons. It seems to prefer fresh water, and is by no means very frequent along the sea coast. Long, narrow, and moderately deep creeks, or small ponds, are more frequented by it than large rivers or lakes.

On the waters of the Western and Southern States, these Mergansers are seen to arrive from the north early in October, but generally later than many species of Ducks, although sooner than either the Red-breasted Merganser or the Goosander. At the approach of night, a person standing still on the banks of such a river as the Ohio, first hears the well-known sound of wings whistling through the air, presently after, a different noise, as if produced by an Eagle stooping on her prey, when gliding downwards with the rapidity of an arrow, he dimly perceives the Hooded Mergansers sweeping past. Five or six, perhaps ten, there are; with quick beats of their pinions, they fly low over the waters in wide circles. Now they have spied the entrance of a creek; there they shoot into it, and in a few seconds you hear the rushing noise which they make as they alight on the bosom of the still pool. How often have I enjoyed such scenes, when enticed abroad by the clear light of the silvery moon, I have wandered on the shores of *la belle rivière*, to indulge in the contemplation of nature!

Up the creek the Mergansers proceed, washing their bodies by short plunges, and splashing up the water about them. Then they plume themselves, and anoint their feathers, now and then emitting a low grunting note of pleasure. And now they dive in search of minnows, which they find in abundance, and which no doubt prove delicious food to the hungry travellers.

At length, having satisfied their appetite, they rise on wing, fly low over the creek with almost incredible velocity, return to the broad stream, rove along its margin until they meet with a clean sand-beach, where they alight, and where, secure from danger, they repose until the return of day. A sly racoon may, when in search of mussels, chance to meet with the sleeping birds, and surprise one of them; but this rarely happens, for they are as wary and vigilant as their enemy is cunning, and were the prowler to depend upon Hooded Mergansers for food, he would be lean enough.

This bird ranges throughout the United States during winter, content with the food it meets with in the bays and estuaries of the eastern coast, and on the inland streams. The dam of the Pennsylvania miller is as agreeable to it as that of the Carolina rice-planter. The Lehigh and Brandywine creek have their fishes, as well as the waters of Bear Grass or Bayou Sara. Nay, the numerous streams and pools of the interior of the Floridas are resorted to by this species, and there I have found them full of life and gaiety, as well as on the Missouri, and on our great lakes. When the weather proves too cold for them, they move southwards, many of them moving towards Mexico.

The Hooded Merganser is a most expert diver, and so vigilant that at times it escapes even from the best percussion gun. As to shooting at it with a flint lock, you may save yourself the trouble unless you prevent it from seeing the flash of the pan. If you wound one, never follow it: the bird, when its strength is almost exhausted, immerses its body, raises the point of its bill above the surface, and in this manner makes its way among the plants, until finding some safe retreat along the shore, it betakes itself to it, and there remains, so that you may search for it in vain, unless you have a good dog. Even on wing it is not easily shot. If on a creek ever so narrow, it will fly directly towards its mouth, although you may be standing knee deep in the middle. It comes up like a ball, rises and passes over head with astonishing speed, and if you shoot at it, do not calculate upon a hit. You may guess how many one may shoot in a day.

When I removed from Pennsylvania to Kentucky, the Hooded Merganser was not uncommon in the neighbourhood of Louisville during summer, and I told WILSON so. On several occasions I caught the young with a partridge net; and let me assure you, reader, that they are not yellow, as is alleged by some writers, but very dark brown. Even when feathered they retain the same colour until the beginning of August, when they gradually change it for the dress of the adult female.

Like all the rest of the tribe, which, when far north, for the want of hollow trees, breeds on the moss or ground, the Hooded Mergansers that remain with us nestle in the same kind of holes or hollows as the Wood

Duck; at least I have found their nests in such situations seven or eight times, although I never saw one of them alight on the branch of a tree, as the birds just mentioned are wont to do. They dive as it were directly into their wooden burrows, where, on a few dried weeds and feathers of different kinds, with a small quantity of down from the breast of the female, the eggs are deposited. They are from five to eight, measure one inch and three-fourths by one and three-eighths, and in other respects perfectly resemble those of the Red-breasted Merganser.

The young, like those of the Wood Duck, are conveyed to the water by their mother, who carries them gently in her bill; for the male takes no part in providing for his offspring, but abandons his mate as soon as incubation has commenced. The affectionate mother leads her young among the tall rank grasses which fill the shallow pools or the borders of creeks, and teaches them to procure snails, tadpoles, and insects. The eggs are laid in May, and the young are out some time in June. On two occasions the parents would not abandon the young, although I expected that the noises which I made would have induced them to do so; they both followed their offspring into the net which I had set for them. The young all died in two days, when I restored the old birds to liberty.

The Hooded Merganser, as well as all the other species with which I am acquainted, moves with ease on the ground, nay, even runs with speed. Those which leave the United States, take their departure from the first of March to the middle of May; and I am induced to believe that probably one-third of them tarry for the purpose of breeding on the margins of several of our great lakes. When migrating, they fly at a great height, in small loose flocks, without any regard to order. Their notes consist of a kind of rough grunt, variously modulated, but by no means musical, and resembling the syllables *croo, croo, crooh*. The female repeats it six or seven times in succession, when she sees her young in danger. The same noise is made by the male, either when courting on the water, or as he passes on wing near the hole where the female is laying one of her eggs.

The males do not acquire the full beauty of their plumage until the third spring, but resemble the females for the first year. In the course of the second, the crest becomes more developed, and the white and black markings about the head and body are more distinct. The third spring they are complete, such as you see the bird represented in the plate.

Dr. BACHMAN has favoured me with the following note respecting this species:—"On the 19th April, 1838, at the plantation of Major PORCHES, on the Santee river, in South Carolina, I obtained an old female Merganser and her five young ones, the latter apparently from two to three weeks old. They were in a very small pond, and could not be driven from it. As we

approached, the female sunk deep into the water, exhibiting only a very small portion of her back above the surface, and swimming with neck outstretched and low along the water. In endeavouring to drive the young to the high grounds, for the purpose of capturing them, they all dived in various directions, like Grebes. On conversing with an overseer, on the following day, he mentioned to me that he had on the previous week obtained several of the young in order to domesticate them, but having neglected to feed them on animal food they had all died. On the following day I met with two other broods, each of five, and was also shewn a cypress tree (*Cupressus disticha*) in the hollow of which a pair had been breeding during the present season. As far as I could learn, they breed in similar situations with the Summer Duck (*Anas Sponsa*), although generally a little earlier. They were all peculiarly marked with two white spots behind the wings on the back.

In an adult male, the width of the mouth is 7½ twelfths; the palate is flat, as is the anterior part of the roof of the mouth, on which are two longitudinal series of slender oblique lamellæ, besides the prominent tooth-like plates of the margins, of which there are 33 on the upper and about 40 on the lower mandible, on each side. Tongue 1½ inches long, and of the same form as in the other species. Œsophagus 7¼ inches long, 1 inch in width in the greater part of its extent, 1 inch 2 twelfths within the thorax. The stomach is a gizzard of moderate strength, 1½ inches long, 1⅓ inches in breadth; its lateral muscles large, being 7 twelfths in thickness; the epithelium dense, tough, and forming two flat grinding surfaces. The proventricular glands are very small, forming a belt 1¼ inches in breadth. The intestine is 51 inches long, its width from 3½ twelfths to 2¾ twelfths; the cœca 9 twelfths long, 2 twelfths wide, 3 inches from the extremity; the rectum 5 twelfths wide, forming at the end a globular cloaca, 1 inch in width. Lobes of the liver nearly equal, 2¼ inches in length; gall-bladder ½ inch long.

Trachea 6¼ inches long, much flattened, for 3 inches diminishing from 3½ twelfths to 2½ twelfths, then enlarging to 4½ twelfths; from this place to the tympanum it is of a trigonal form, with an acute carina anteriorly, and the rings are widely separated. There are 102 rings, besides 8 which are united and form part of the tympanum, which is of an irregular form, projecting anteriorly with a rounded bulge, and dilated on the left side, its greatest breadth 9 twelfths. The bronchi are of moderate length, the left with 32, the right with 26 half rings. The muscles as in the other species; the contractor muscles exceedingly large at the upper part.

Mergus cucullatus, Bonap. Syn., p. 397.

Hooded Merganser, *Mergus cucullatus*, Wils. Amer. Orn., vol. viii. p. 79.

MERGUS CUCULLATUS, *Hooded Merganser*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 463.

HOODED MERGANSER, Nutt. Man., vol. ii. p. 465.

HOODED MERGANSER, *Mergus cucullatus*, Aud. Orn. Biog., vol. iii. p. 246; vol. iv. p. 619.

Male, 19, 26. Female, 17½, 24.

Breeds sparingly in South Carolina, along the Mississippi, Ohio, and the Great Lakes, as well as farther northward. Abundant, during autumn and winter, on all the western and southern waters; rarer in the Middle Atlantic Districts.

Adult Male.

Bill about the length of the head, straight, somewhat cylindrical, deeper than broad at the base. Upper mandible with the dorsal outline sloping gently to the middle, then straight, along the unguis curved, the ridge broad at the base, then convex, the sides sloping at the base, convex towards the end, the edges serrated beneath, with twenty-five tooth-like lamellæ directed backwards, the unguis oblong, much curved, rounded at the end. Nasal groove oblong, sub-basal, filled by a soft membrane; nostrils linear-elliptical, sub-medial, direct, pervious. Lower mandible with the angle very narrow and extended to the roundish unguis, the sides rounded, with a long narrow groove, the edges with about twenty-five lamellæ.

Head of moderate size, compressed, oblong. Neck rather short, body full and depressed. Wings small. Feet placed far behind, extremely short; tibia bare for a short space above the joint; tarsus extremely short, compressed, anteriorly covered with scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes double the length of the tarsus; second shorter than fourth, which is nearly as long as the third, all connected by reticulated webs, of which the outer is deeply cut; the outer toe slightly margined, the inner with a broad marginal membrane. Claws short, considerably curved, compressed, acute, that of the middle toe with a thin inner edge.

Plumage on the upper parts strong and imbricated, on the lower blended and glossed; on the head and neck soft and blended, the feathers of the upper part of the head elongated and capable of being erected into a long compressed rounded crest, those of the shoulders very broad and elongated. Wings very short, small, curved, and pointed; primaries narrow, tapering, the first scarcely shorter than second, the rest rapidly graduated; secondaries short, narrow, rounded, the inner elongated and tapering. Tail short, graduated, of sixteen rounded feathers.

Bill black. Iris yellow. Feet yellowish-brown; claws dusky. Upper part of the head, back, smaller wing-coverts, quills and tail, brownish-black; sides of the head, upper half of the neck all round, the broad extremities of

the large feathers on the shoulders, the scapulars, inner secondaries, and larger wing-coverts, greenish-black. A broad patch of white behind the eye, very conspicuous in the erected crest. Lower part of neck and breast also white, as are the speculum and the central part of the inner secondaries. Sides beautifully marked with undulated transverse lines of yellowish-brown and brownish-black; lower tail-coverts whitish, similarly undulated.

Length to end of tail 19 inches, to end of wings 16¾, to end of claws 18; extent of wings 26; wing from flexure 7½; tail 4; bill along the ridge 1$\frac{1}{12}$, along the edge of lower mandible 1¾; tarsus 1¼, middle toe 1$\frac{21}{12}$, its claw ¼. Weight 1 lb. 7 oz.

Adult Female.

The female is much smaller than the male. The crest is smaller and of a looser texture; the feathers of the shoulders not so large; those of the sides shorter and more compact. The bill is brownish-black towards the end and along the ridge, orange towards the base. The upper part of the head, including the crest, yellowish-brown; chin whitish, upper part of neck and sides of the head greyish-brown. The general colour of the back, upper surface of wings, tail, and sides, is blackish-brown, the feathers edged with paler, the edgings of the fore part of the back and shoulders larger and pale greyish-brown; speculum greyish-white; breast and abdomen pale yellowish-brown.

Length to end of tail 17½ inches, to end of claws 16½; extent of wings 24. Weight 1 lb.

The young resemble the female. The young males after their first moult still resemble the female, but have the speculum and lower parts pure white.

2.

White Merganser, Smew, White Nun.

1 Male. 2 Female.

Drawn from Nature by J. J. Audubon F.R.S.F.L.S. Bowen & Co. lith & col. Philada.

WHITE MERGANSER.—SMEW, OR WHITE NUN.

MERGUS ALBELLUS, *Linn.*

PLATE CCCCXIV.—MALE AND FEMALE.

The Smew is a bird of extremely rare occurrence in the United States, insomuch that it must be considered merely as a transient or accidental visiter. Indeed, I have felt strong misgivings on reading WILSON's article on this species, and cannot but think that he is mistaken when he states that it "is much more common on the coast of New England than farther south;" and again "in the ponds of New England, and some of the lakes in the State of New York, where the Smew is frequently observed—." Now, although I have made diligent inquiry, not only in New England, but in every part of our country where I thought it likely that the Smew might occur, I have not met with any person well acquainted with birds of this family, who has seen it. WILSON, in short, was in all probability misinformed, and it is my opinion that his figure was made from a stuffed European specimen which was then in Peale's Museum in Philadelphia, and that he had taken the Buffel-headed Duck, seen at a distance, for this species, as I am aware, has been the case with other individuals.

The only specimen procured by me was shot by myself on Lake Barataria, not far from New Orleans, in the winter of 1819. It was an adult female in fine plumage. How it had wandered so far south is an enigma to me; but having found it, and made a drawing of it on the spot, I have taken the liberty to add one of the other sex from an equally fine specimen. After all, the Smew can scarcely be considered as belonging to the American Fauna, any more than our Fork-tailed Hawk can with propriety be called a denizen of England; and in this I am supported by all the great navigators of our Arctic Seas, such as ROSS, PARRY, and FRANKLIN, none of whom, nor any of their companions, ever met with a single individual of this beautiful bird.

SMEW or WHITE NUN, *Mergus Albellus*, Wils. Amer. Orn., vol. viii. p. 126.
MERGUS ALBELLUS, Bonap. Syn., p. 398.
SMEW or WHITE NUN, Nutt. Man., vol. ii. p. 467.
SMEW or WHITE NUN, *Mergus Albellus*, Aud. Orn. Biog., vol. iv. p. 350.

Male, 17½, 27. Female, 15½, 25.

Exceedingly rare in America, one specimen only having been procured at New Orleans.

Adult Male.

Bill rather shorter than the head, straight, rather slender, a little higher than broad at the base, tapering, somewhat cylindrical toward the end. Upper mandible with the dorsal outline sloping gently and slightly concave to the middle, then straight, at the tip decurved, the ridge rather broad and flat at the base, then convex, the sides sloping at the base, convex toward the end, the edges serrate beneath, with about forty slightly reversed, compressed, tapering, tooth-like lamellæ, the unguis elliptical, much curved. Nasal groove oblong, sub-basal, filled by a soft membrane; nostrils oblong, sub-medial, direct, pervious. Lower mandible with the angle very narrow and extended to the obovate, very convex unguis, the sides rounded, with a long groove, the edges with about sixty perpendicular sharp lamellæ.

Head of moderate size, oblong, compressed. Neck of moderate length. Body full and depressed. Feet placed far behind, extremely short; tibia bare for a quarter of an inch; tarsus extremely short, much compressed, anteriorly covered with a series of very small scutella, and another row on the lower half externally, the sides reticulate. Hind toe very small, with an inferior free membrane; anterior toes double the length of the tarsus; the second shorter than the fourth, which is nearly as long as the third; all connected by reticulated webs, of which the outer is deeply emarginate. Claws short, considerably curved, compressed, acute, that of the middle toe with a thin inner edge.

Plumage full, soft, and blended; feathers of the head and upper part of the hind neck very slender, and elongated along the median line into a narrow decurved crest; those of the shoulders obovate and abrupt, of the rest of the upper parts ovate, of the lower elliptical. Wings very short, narrow, curved, and pointed; primaries narrow, tapering, the first scarcely longer than the second, the rest rapidly graduated; secondaries short, narrow, rounded, the inner tapering to an obtuse point. Tail short, graduated, of sixteen rather narrow, tapering feathers.

Bill dark greyish-blue. Iris bright red. Feet livid blue, claws dusky. The general colour of the plumage is pure white; a short band on each side of the hind neck bordering the crest, duck-green; a broad patch on the lore and below the eye, a narrow band across the lower part of the hind neck, formed by single bars near the tips of the feathers, the middle of the back in its whole length, a short transverse bar under the fore edge of the wing, the anterior margin of that organ to beyond the carpal joint, the outer edges of the scapulars, the primary coverts, the secondary coverts, and the outer secondary quills, exeepting the tips of both, deep black. The quills are also

black, but of a less deep tint; the hind part of the back becomes tinged with grey, and the rump and tail-feathers are dusky grey. The sides of the body and rump are white, finely undulated with blackish-grey.

Length to end of tail 17½ inches, to end of claws 18¼, to end of wings 15½; extent of wings 27; bill along the ridge 1$\frac{3}{16}$, along the edge of lower mandible 1$\frac{7}{16}$; wing from flexure 7¾; tail 3½; tarsus 1$\frac{1}{16}$; first toe ½, its claw $\frac{3}{16}$; second toe 1½, its claw $\frac{4}{16}$; third toe 1$\frac{1}{16}$, its claw $\frac{4}{16}$; fourth toe 1$\frac{2}{16}$, its claw $\frac{3}{16}$. Weight 1 lb. 8 oz.

Adult Female.

The female is much smaller. The feathers of the hind part of the head and neck are also elongated so as to form a crest. The bill, iris, and feet, are coloured as in the male. All the lower parts are white, excepting a broad band of light grey across the middle of the neck, and a narrow portion of the sides, which are of a deeper tint. There is a patch of brownish-black on the lore and beneath the eye; the upper part of the head and half of the hind neck are light reddish-brown; the rest of the hind neck, and all the upper parts, bluish-grey, darker behind, and in the middle of the back approaching to black. The wings as in the male, that is black, with a large patch of white, and two narrow transverse bands of the same; the tail dusky grey.

Length to end of tail 15¼ inches, to end of claws 16½, to end of wings 14½; extent of wings 25. Weight 1 lb. 4 oz.

FAMILY XLI.—PELECANINÆ. PELICANS.

Bill longer than the head, rather slender, straight, upper mandible with the ridge separated from the side by a groove, and terminated by a narrow, generally decurved, pointed unguis; lower mandible with the crura elastic and extensile, the angle very long and narrow. Nostrils basal, lateral, linear, small, or obsolete. Space around and before the eye generally bare, as is a portion of the gular sac. Head generally of moderate size, but various; neck long; body elongated, rather slender. Feet short and stout; tibia bare at its lower parts; tarsus short, very stout, compressed, scaly or scutellate in front; toes four, all connected by webs, and scutellate; first small, fourth longest. Claws short, strong, curved, rather blunt, that of the third toe generally pectinate. Plumage soft, blended, on the back compact and imbricated. Wings long; tail of moderate length, narrow, rounded or tapering. Tongue extremely small, triangular, fleshy; œsophagus excessively wide; a gular sac, sometimes of enormous capacity; proventricular belt generally discontinuous: stomach very small, slightly muscular, epithelium smooth; a globular pyloric lobe; intestine very long and slender; cœca small, cylindrical; cloaca globular. Trachea simple, flattened; no inferior laryngeal muscles.

GENUS I.—PHALACROCORAX, *Briss.* CORMORANT.

Bill about the length of the head, rather slender, nearly straight, compressed toward the end; upper mandible with the dorsal line concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edge sharp and nearly straight as far as the unguis, which is decurved, convex above, acute, its tip ascending far beyond that of the lower; lower mandible with the angle long and very narrow towards the end, filled up by an extensile membrane, which extends to the level of the angle of the mouth; the outline of the crura very slightly convex, that of the terminal part descending and very slightly convex, the sides convex, the edges sharp and inflected, the tip compressed, with its marginal outline decurved. Nostrils obliterated (in youth open) Head rather small, oblong; neck long and

Common Cormorant

1. Male. 2. Female 3 Young.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T.Bowen Philad.a

rather thick; body full, elongated, depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much depressed, covered all round with angular scales; a series on part of the inner side anteriorly, and another on the lower part of the outer, scutelliform. Toes all placed in the same plane, connected by webs, and covered above by very numerous oblique scutella; first the smallest, fourth the longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge. Plumage soft, generally blended, compact on the back and wings; the small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings of moderate size, broad; primaries curved, pointed, the second longest. Tail of moderate length, very narrow, much rounded, of twelve or more narrow strong-shafted feathers. Gular sac small; tongue extremely small; œsophagus very wide; proventricular glands disposed in two large roundish masses; stomach small, slightly muscular, inner coat smooth and soft; a globular or triangular pyloric lobe; duodenum at first curving upwards; intestine very long, and of moderate width; cœca small; rectum narrow; cloaca globular. Trachea considerably flattened; bronchi of moderate width.

THE COMMON CORMORANT.

PHALACROCORAX CARBO, *Linn.*

PLATE CCCCXV.—MALE, FEMALE, AND YOUNG.

Look at the birds before you, and mark the affectionate glance of the mother, as she stands beside her beloved younglings! I wish you could have witnessed the actions of such groups as I did while in Labrador. Methinks I still see the high rolling billows of the St. Lawrence breaking in foaming masses against the huge cliffs, on the shelves of which the Cormorant places its nest. I lie flat on the edge of the precipice some hundred feet above the turbulent waters, and now crawling along with all care, I find myself only a few yards above the spot on which the parent bird and her young are fondling each other, quite unconscious of my being near. How delighted I am to witness their affectionate gratulations, hear their lisping

notes, mark the tremulous motions of their expanded throats, and the curious vacillations of their heads and necks! The kind mother gently caresses each alternately with her bill; the little ones draw nearer to her, and, as if anxious to evince their gratitude, rub their heads against hers. How pleasing all this is to me! But at this moment the mother accidentally looks upward, her keen eye has met mine, she utters a croak, spreads her sable wings, and in terror launches into the air, leaving her brood at my mercy. Far and near, above and beneath me, the anxious parent passes and repasses; her flight is now unnatural, and she seems crippled, for she would fain perform those actions in the air, which other birds perform on the ground or on the water, in such distressing moments of anxiety for the fate of their beloved young. Her many neighbours, all as suspicious as herself, well understand the meaning of her mode of flight, and one after another take to wing, so that the air is in a manner blackened with them. Some fly far over the waters, others glide along the face of the bold rock, but none that have observed me realight, and how many of those there are I am pretty certain, as the greater number follow in the track of the one most concerned. Meanwhile the little ones, in their great alarm, have crawled into a recess, and there they are huddled together. I have witnessed their pleasures and their terrors, and now, crawling backwards, I leave them to resume their ordinary state of peaceful security.

It was on the 3d of July, 1833, about three in the morning, that I had the pleasure of witnessing the scene described above. I was aware before that a colony of Cormorants had nested on the ledges of the great rocky wall that separated our harbour of Whapatiguan from the waters of the Gulf of St. Lawrence. A strong gale had ruffled the sea, and the waves dashed with extreme violence against the rocks, to which circumstance, I believe, was owing my having remained awhile unseen and unheard so near the birds, which were not more than four or five yards below me. The mother fondled and nursed her young with all possible tenderness, disgorged some food into the mouth of each, and coaxed them with her bill and wings. The little ones seemed very happy, billed with their mother, and caressed her about the breast. When the parent bird flew off on observing me, the young seemed quite frightened, squatted at once on their broad nest, and then crawled with the aid of their bills until they reached a recess, where they remained concealed.

On another occasion, my young friends LINCOLN and COOLEDGE, along with my son, went to the same rocks, for the purpose of bringing me a nest and some of the young Cormorants. They reported that, in one instance, they surprised the parent birds close beneath them, apparently asleep, resting on their rumps in an upright position, with the head thrust under the wing,

and that, had they had a noose attached to their poles, they might have secured at least one of them, but that after a few minutes one drew out her head, stretched her neck, and after looking around flew off croaking, so as to alarm all her neighbours.

We saw no nests of this species placed in any other situations than the highest shelves of the precipitous rocks fronting the water and having a southern exposure. No other Cormorants bred on the spots of which this kind had taken possession; but Ravens and Peregrine Falcons were observed to have nests on the same rocks, and in some instances close to them. The nests were formed of a quantity of small dry sticks, matted in a rude manner with a large quantity of weeds and moss, to a thickness of four or five inches in new nests, and in others to that of a foot or more; for we observed that this species, as well as the Double-crested and the Florida Cormorants, repair and enlarge their tenements each season, and return to the same rocks many years in succession, as was shewn by their places of resort remaining white-washed with excrements through the winter, in which condition we saw them previous to the arrival of the birds that season. The nests varied in breadth according to the space on which they were placed; where there was ample room, they measured at the base from thirty to thirty-six inches in diameter; others were scarcely large enough to hold the young, which nevertheless seemed as contented as their neighbours. On some shelves, eight or ten yards in extent, the nests were crowded together; but more usually they were placed apart on every secure place without any order; none, however, were below a certain height on the rocks, nor were there any on the summit. The nests being covered with filth, were offensive to the eye, and still more so to the nose. The eggs, three or four in number, more frequently the former, average two inches and five-eighths in length, by one inch and three-quarters in breadth, the shell of a uniform pale bluish-green colour, mostly coated over with calcareous matter.

The young are at first of a dark purplish livid colour, and have a very uncouth appearance, their legs and feet seeming enormous. In less than a fortnight they become covered on all the upper parts with brownish-black down, but the abdomen remains bare much longer than the rest. They increase rapidly in size, and are fledged in six or seven weeks. Some that were weighed when about a month old, averaged three pounds, and others almost able to fly six pounds, the young of this species, as of most water birds, being much heavier than the parent at the time of leaving the nest. We procured several of different sizes, which we kept on the deck. Whenever a person approached them, they raised their heads, stretched their necks, and opened their bills, so as to expand the skin of the throat, which they made to vibrate, while they uttered a sort of hissing mutter of a very strange

character, but resembling that of the young of the Brown Pelican. They crawled sluggishly about, aiding themselves in their progress with their bills, and at all times looked extremely clumsy. They took food very readily, ate a prodigious quantity, certainly more than their own weight each day, and appeared always ready to receive more. When thrown overboard, they swam off under water, like the old birds, with considerable speed, moving their unfledged wings all the while. Some would not rise for twenty or thirty yards, but few went farther under water than that distance, and they were soon fatigued. On one occasion, some half-grown young birds threw themselves from their nest, or were pushed off by their parents while in the agonies of death, they having been shot at. As they passed quickly downwards through the air, they moved their wings with great rapidity, and the instant they reached the water they disappeared beneath the surface.

This Cormorant swims at times with astonishing speed, keeping itself deeply immersed. Now and then, should it apprehend danger, it sinks so far as to shew only the head and neck, in the manner of the Anhinga. When searching for food in clear shallow water, they frequently swim with the rump rather elevated, and the head under, in the manner of the Shoveller Duck on such occasions, as if they were looking for prey on the bottom; but I never observed them act thus when the depth of water exceeded a few yards. They secure their prey by diving and pursuing it under water, with the wings partially extended and employed as paddles, while the tail directs their course, and checks or accelerates their speed. I have observed this in the Florida Cormorant, as well as in the present species. I never saw one while flying plunge after its prey; but I have repeatedly seen them drop from a rock headlong into the sea when shot at for the purpose of observing their actions.

Cormorants, Pelicans, Ducks, and other water birds of various kinds, are, like land birds, at times infected with insects which lodge near the roots of their feathers; and to clear themselves of this vermin, they beat up the water about them by flapping their wings, their feathers being all the time ruffled up, and rub or scratch themselves with their feet and claws, much in the same manner as Turkeys and most land birds act, when scattering up the dry warm earth or sand over them. The water birds after thus cleansing themselves remove, if perchers, and able to fly, to the branches of trees, spread out their wings and tail in the sun, and after awhile dress their plumage. Those which are not perchers, or whose wings are too wet, swim to the shores, or to such banks or rocks as are above water, and there perform the same process. The Florida Cormorant is especially addicted to this practice, and dives and plumes itself several times in the day. The Double-crested and the present species, which inhabit colder regions, seem to be

satisfied with less frequent trimming, and go through the operation only once a-day, at the warmest period. I never observed any of these birds in their natural free state perform these actions in rainy or even cloudy weather, but have frequently seen Cormorants in a state of captivity do so on small artificial ponds, such as those of the London Zoological Gardens.

When they have landed after cleansing themselves by washing, they usually extend their wings, and flap them for awhile, in the manner of young birds of any kind when trying the strength of their wings before leaving the nest. They are extremely regular in returning to the same places to roost, at the approach of night, when hundreds appear to congregate on their way there, as they pass over the different fishing grounds. Those that have no broods, spend the night apart from the rest, standing nearly erect in files on the most elevated shelves, to which they ascend in the manner of some Hawks, when about to perch on any elevated spot. In winter, however, I observed some near Boston roosting singly, and immediately over their fishing places, which are usually the eddies under the projecting points of rocky islands. They are shy and wary at all periods; but when congregated in the day, it is almost impossible to approach them while fishing, for they dive and return to the surface one after another, so that one or more are constantly on the watch, and act as sentinels. It is in general quite useless to pursue one that has been wounded.

The flight of this species is strong, swift, and remarkably sustained. They usually fly in long strings, now and then forming angles, at a moderate elevation in the air. When on the rocks, they stand erect on their rump, with the neck gracefully curved, and resting between the shoulders. You may see them in hundreds, when they look like a crowd of black dominoes. If alarmed, they extend their neck to its full length, and move their head sideways to observe your motions; and if you approach them, they gradually raise and extend their wings, elevate the tail, incline the body forwards, and fly off in silence.

All our Cormorants feed principally on fish of various kinds. When they have seized one that is too large to be swallowed entire, they carry it to the shore, or to the branch of a tree, and there thrash and tear it to pieces. Some fishes which they have swallowed evidently incommode them, and on such occasions I have sometimes seen them shake their heads with great violence, and disgorge the fish, or pass it downwards into the stomach. The young ones which we kept several weeks at Labrador, performed both actions, but generally the first. All the species are expert at tossing up a fish inconveniently caught, a foot or so above their head, and receiving it in their extended gullet, in the same manner as the Frigate Pelican. Some which I have observed in a domesticated state, were so expert at receiving a

fish thrown to them from the distance of several yards, by a sudden and precise movement of the neck and head, as seldom to miss one in a dozen.

The courtship of this species is so similar to that of the Florida Cormorant, that I consider it unnecessary to describe it, as I should merely repeat what is said with respect to that species. I have seen them act in the same manner, both on the shelves on which the nests were placed, and on the water. They begin to lay about the first of June, on the islands near the Bay of Fundy, about a fortnight later in Labrador; and it is my opinion that the younger birds spend their breeding season in the former places.

The Common Cormorant walks in a waddling and awkward manner, but at a good pace, and leaps from one stone to another, assisting itself with its wings, and occasionally with the tail, which acts as a kind of spring. I am unable to say at what age this species attains the full dress of the love season, but it cannot be in less than three years, as some which I have known to have been kept in a state of constant captivity, did not shew the white patch on the thigh, nor the slender white feathers around the head and part of the neck, until the middle of May, in the fifth year. That the younger birds of this and other Cormorants, breed before they have acquired the full beauty of their plumage, is a fact which I have had many opportunities of ascertaining. The Common Cormorant is found breeding, both near the entrance of the Bay of Fundy, and along the coast of Labrador, in flocks of fifty or more pairs, of which not an individual shews any white unless on the sides of the head, and along the throat, but much duller on these parts than even in the female represented in the plate, which was yet what may be termed an immature bird. No differences appear in the garb of the sexes, in their different states of plumage, and perfect specimens of both are equally beautiful in the breeding season, being then similar to the male of which I have endeavoured to present a good portrait. I have observed a greater difference in size between individuals of this species, and those of any other.

The white markings observed on the old birds of this species, during the period of courtship, incubation, and rearing of the young until they are able to fly, and which extends to two months and a half, begin to disappear from the moment incubation has fairly begun, and at the time when the young leave the nest scarcely any remain, unless on the sides of the head. In autumn and winter the feathers of the head are similar to those of the neck, and the plumage in general has lost much of its vernal and æstival beauty. The entire crest also falls off in autumn. The white markings and the crest are renewed in the wild state about the end of February; but in birds kept in domestication rarely before May. The young do not exhibit the crest until the second spring, at which period, being yet destitute of white

markings on the head and thighs, they might readily be mistaken for a different species, by a person unacquainted with their habits.

The singular fact that the young of some species of Cormorant have *open nostrils* until they are nearly half-grown, may surprise you as much as it surprised me. Having observed it in many individuals, I preserved one in spirits, and of it you will find a description beneath.

The Common Cormorant is rarely seen farther south than the extreme limits of Maryland; but from Chesapeake Bay eastward, it becomes more plentiful; and in severe winters, I have seen it exposed for sale in the New York market. They are abundant in winter around the islands of the Bay of Boston, and on the coasts of Massachusetts and Maine, where most of them remain during autumn, winter, and the early part of spring, as well as on the Bay of Fundy and along the shores of Nova Scotia. I am unable to say how far north they go beyond Labrador, to breed, or what may be the limits of their range on the St. Lawrence in autumn. I have never seen one on a tree, or on fresh water. The flesh of this species is dark, tough, and fishy, its eggs also do not furnish agreeable food, and it is seldom that either are eaten, even by epicures.

PHALACROCORAX CARBO, Bonap. Syn., p. 402.
CORMORANT, Nutt. Man., vol. ii. p. 479.
COMMON CORMORANT, *Phalacrocorax Carbo*, Aud. Orn. Biog., vol. iii. p. 458.

Male, 37, 62.

Ranges during winter southward to New York. Abundant from Massachusetts eastward. Breeds on high precipitous rocks, in Newfoundland, Labrador, and Baffin's Bay. Migratory.

Adult Male in March.

Bill about the length of the head, rather slender, somewhat compressed, straight, with the tip curved. Upper mandible with the dorsal line sloping and slightly concave, at the tip decurved, its ridge broad and rounded, and separated from the sides by a narrow groove, the sides erect, irregularly scaly, convex, the edges sharp and straight as far as the unguis, at the base a distinct horny plate, the unguis 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 short dorsal line a little convex, then concave, the sides scaly, erect, and slightly convex, the edges sharp and inflected, the tip compressed and obliquely truncate.

Head rather large, oblong, narrowed before. Neck long and stout. 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 outer are sub-hexagonal, the inner transversely elongated, 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 strong, curved, compressed, acute, 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 loose glossy margins. The middle feathers of the occiput and hind neck are elongated, and those of the head and upper neck are intermixed with numerous linear feathers of a different colour, and erectile at will. 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, third longest, second almost as long, first little shorter; secondaries decurved, broad, broadly rounded, the inner broad and shorter. Tail small, much rounded, of fourteen narrow, rounded feathers, having extremely long shafts.

Upper mandible greyish-black, along the edges yellowish-white; lower yellowish-white at the base, dusky towards the end. Iris light bluish-green, margins of eyelids dusky. Bare space about the eye dull olive, below it bright red, the gular sac yellow. Feet and claws greyish-black. All the silky part of the plumage is black, glossed with deep greenish-blue; at the base of the gular sac is a broad gorgelet of white, and the linear interspersed feathers over the head and upper neck are white, there is also a large parcel of elongated white feathers on the side over the thigh. The feathers of the wings and part of the back are dull bluish-grey glossed with bronze, their fringe-like margins greenish-black. Primary quills greyish-black, secondary like the other feathers of the wing. Tail greyish-black. The shafts of all the feathers are black at the end, leaden-grey towards the base.

Length to end of tail 37 inches, to end of claws 36; to end of wings 32; extent of wings 62; wing from flexure 14; tail 6½; bill along the ridge $3\frac{5}{12}$, along the edge of lower mandible $4\frac{2}{12}$; tarsus 2¾; outer toe $3\frac{7}{12}$, its claw $\frac{11}{12}$. Weight 7½ lbs.

Female in July.

The female when old is similar to the male. In the state here represented, the plumage in general is similar, but the white feathers of the head and thighs are wanting. The bill, eyes, and feet are coloured as in the male, as are the bare parts about the base of the bill, only the part under the eye which is bright red in the male, is bright yellow in the female.

Young birds unfledged.

The inside of the mouth and the gular sac flesh-coloured; the bill dusky,

at the base flesh-coloured; the eyes bluish-grey. The general colour of their skin is dull livid; the feet purplish-dusky, the webs yellowish-brown.

The following is a description of the smaller individual represented in the plate, and which was about two weeks old. The length is twelve inches and a half; the colour dull livid, the abdomen and breast lighter, the forehead, gular sac, and bases of the mandibles, flesh-colour, tinged with yellow, as is the mouth. The head and upper part of the neck are bare, as well as the lower surface of the wings. Over the rest of the body are small down tufts rising in regular series, excepting along an impressed line extending from the anterior part of the thorax to the anus. The apertures of the ears are round, extremely small, being only half a twelfth in diameter; the eyes very small, the iris grey. The aperture of the posterior nares is linear-lanceolate, smooth on the edges, half an inch long. A probe introduced into it passes readily out by the nostril, which is basal, linear, small, two-twelfths long, placed at the commencement of the long groove which separates the sides from the ridge of the mandible, and covered above by the skin, so as to be not readily observed, although it is easily dilatable. Each internal nostril is oblique, much wider below, and has on its inner side a transverse soft ridge, which divides it into two cavities, the posterior deep and funnel-shaped, passing backwards and upwards, the anterior becoming narrower towards the external aperture. The tongue is extremely small, four-twelfths long, elliptical, with a central ridge. The œsophagus is extremely dilatable, and as far as the middle of the neck is of larger diameter than below, but it again dilates as it enters the stomach. Its length is five inches and a half. The inner coat is smooth in its dilated part, but in the rest is raised into numerous longitudinal ridges or folds, which at the lower part are undulated. The stomach is oblong, four and a half inches long, quite membranous, and without apparent central tendons. The gastric glands are disposed so as to occupy two spaces, the one three and a half inches by two, the other a little smaller. The inner coat is soft and without wrinkles. The intestine is five feet two inches long, at its upper part three-twelfths in diameter, gradually diminishing to one-twelfth. At the distance of two inches from the anus are two cœca, three-twelfths long, one-twelfth in diameter, and rounded. The contents of the stomach were fragments of fish, with numerous bones, and a pebble about half an inch in diameter. The heart triangular, much flattened. The liver of two very unequal lobes, the right one two inches and a half long, the other one and a half. The specimen, which I had preserved in spirits, was examined in my presence by my friend Mr. MACGILLIVRAY. Whether the fact of the anterior aperture of the organ of smell being open in the young Cormorant has been observed by any other person than myself, I know not; but it would seem that the general opinion is, that Cormorants

have no external nares in any stage, and although some state that in the adult they exist, and are extremely small, others allege that there are none at all.

A young female, shot in the end of October, on being carefully examined, was found to present the following characters.

The length to the end of the tail was 36 inches, to the end of the wings 29¾, to the end of the outer toe 34½; the extent of the wings 55; the weight 5 lbs. 10½ oz.

Bill along the ridge and unguis black, the sides brownish-grey; the lower mandible brownish-grey, dusky on the sides at the middle, the bare skin at the base yellow, as is the gular sac. Upper part of the head and hind neck brownish-black; the back greenish-black, its fore part, the scapulars and the wing-coverts brownish-grey, the feathers edged with greenish-black, and an outer margin of brownish-white, most conspicuous on the secondary coverts; the quills brownish-black, the secondaries tinged with grey on the outer edge; the tail greyish-black, the shafts greyish-blue. Upper part of the throat brownish-white; the rest of the neck greyish-white, mixed with brown; the breast and abdomen white, the sides greenish-black; the lower surface of the wings dusky; the lower tail-coverts greyish-brown, the feathers before them brownish-black. The feet greyish-black; the inner edge of the middle claws very slightly pectinated. The foot, when stretched to its full extent, measures, from the tip of the first to that of the fourth claw, 5⅛ inches.

The tongue is oblong, carinate above, $\frac{7}{12}$ long, $\frac{3}{12}$ broad. The palatal slit or aperture of the posterior nares is linear, $1\frac{3}{12}$ long, with a soft flap on each side. The mouth is $1\frac{5}{12}$ wide; the bill 3¼ along the back, 4 along the edge of lower mandible. The aperture of the ear is circular, only half a line in diameter.

On blowing into the posterior nares no air passes. The internal cavities are separated by a longitudinal membranous dissepiment; each cavity is transversely divided by a membranous partition, but neither of the chambers thus formed has any external communication by the mandible. The lachrymal duct, which is wide, passes obliquely forward and downward into the anterior cavity. On gradually slicing the horny covering of the mandible over the place where the nostril ought to be, its position is found clearly defined, there being a slight discontinuity of the bone at that part; but on cutting farther all traces disappear, the original aperture being closed by ossification.

The aperture of the glottis has thick prominent rounded edges, which unite behind and terminate in three knobs, and there is a small transverse flap on each side behind.

The heart is triangular, depressed, obtuse, 2¼ inches long, its greatest breadth 1$\frac{7}{12}$. The liver has two very unequal lobes, the right 5 inches, the left 3 inches long; the former 2½ broad, the latter 1¾. The gall-bladder is 2¼ long, $\frac{3}{12}$ in diameter, rounded, but not much enlarged at the extremity.

The œsophagus is 22½ inches long; at its upper part when dilated upwards of two inches wide, extremely thin, its circular fibres distinct. It is contracted in the whole length of the thorax, where its smallest diameter is $\frac{5}{12}$, the largest $\frac{9}{12}$; but this part, which in the ordinary state has its inner coat folded into numerous longitudinal wrinkles, is capable of being dilated so as to present a diameter of more than 3 inches, when the internal rugæ disappear. The proventriculus seems at first to form part of the stomach; its walls are extremely thick and studded with glandules, disposed in two circular patches, which are separated by a space of about $\frac{3}{12}$ of an inch. The stomach properly so called is very small; its muscular coat thin, but with two distinct tendons. It is of an oblong form, compressed, and at its upper parts has a rounded lobe, from which the intestine comes off. The inner coat is thick, soft, and rugous. The pylorus has a circular marginal rim. The intestine, which is 8 feet long, is at its upper part $\frac{9}{12}$ in diameter, towards the cœca $\frac{4}{12}$. The rectum is 7 inches long, its diameter for 4½ inches is $\frac{7}{12}$; the cloaca globular, 2$\frac{2}{12}$ in diameter; the cœca $\frac{5}{12}$ long. The cystic duct enters one inch below the hepatic; between them enters one of the pancreatic ducts, the other 2 inches farther up. The distance from the pylorus to the hepatic duct is 16½ inches.

The lungs extend to the kidneys. The ovules exceedingly small and numerous. In the proventriculus and lower part of the œsophagus were many small ascarides. The contents of the stomach were a few bones of fishes.

Although I have not actually observed that Cormorants have the power of disgorging such substances as they are unable to digest, I should not be surprised to find this to be the case, when their habits are investigated in a state of domestication.

THE DOUBLE-CRESTED CORMORANT.

PHALACROCORAX DILOPHUS, *Swains.*

PLATE CCCCXVI.—MALE.

The objects that more especially attract the notice of the voyager, as he draws near the south-west coast of Labrador, are the numerous low islands covered with countless multitudes of birds, that have assembled there for the purpose of reproduction. Some miles farther, you see a ridge of craggy and desolate cliffs, emerging from the sea, and presenting the appearance of a huge granite wall. This forms a partition between the waters of the great St. Lawrence and many fine harbours hidden here and there behind it, along with numerous inlets and bays, coves and small creeks, in which the bark of the adventurer may ride in comparative safety. From the hoary summit of this bulwark the view is grand beyond description; valleys richly carpeted with moss and thickets of low shrubs glow in tints of the richest green; clear blue lakes bear on their bosom numerous birds of varied wing, while around their margins the females are seated on their eggs or carefully leading about their young; banks of perennial snow arrest your eye for a moment, and perhaps produce an involuntary chill; onward towards the horizon, mountains heaped confusedly behind mountains, mingle their gloomy tints with those of the cold sky. In that land, man may for weeks, even months, seek for his kind in vain. The deep silence that reigns around him during a calm, seldom fails to bring sadness to his heart, as his eye grows dim with gazing on the wilderness. Should the northern gale issue from its snowy chambers, darkness follows in its train, and should its whole fury pour upon you, melancholy indeed must be your lot.

To the low islands above alluded to, the beautiful Cormorant represented in the plate before you, resorts each spring, for the purpose of breeding. It arrives from the south about the beginning of May, or as soon as the waters of the Gulf are sufficiently free of ice to enable it to procure food. The winter it spends on our eastern coasts, but it rarely proceeds farther south than the Capes of North Carolina, about which it meets its southern friend the Florida Cormorant, on whose dominions, however, it does not venture.

While with us, the Double-crested Cormorants are seen flying in long lines, sometimes forming angles, and passing low over the water, at no great

Double crested Cormorant.

Male.

Drawn from Nature by J.J.Audubon FRSELS Lith.Printed & Col.d by J.T.Bowen Philad.a

distance from the shore. They enter our large bays, rivers and creeks, going up as far as the tide, but are seldom or never seen fishing in fresh-water. Their stay along the Middle Districts continues from the beginning of October to the middle of April; farther east they are seen a month earlier, and disappear a fortnight later. A good number breed on the Seal Islands off the Bay of Fundy, but the greater part return to Labrador and Baffin's Bay, where Dr. RICHARDSON found this species. To that excellent man and intrepid traveller, we are indebted, among other valuable fruits of his labours, for the first good description of this bird. From his account and the information which I have received from Captain JAMES CLARK ROSS, I believe that it does not go much farther north than the place where it was observed by the first mentioned traveller; and no Cormorants were seen during the late voyage to the Arctic circle. It is probable that neither the Double-crested nor the Florida Cormorants occur in any part of Europe; at least, if they have been described as birds of that quarter of the globe, I can find no account sufficiently correct to enable me to recognise them.

A few miles from one of the entrances of the Harbour of Whapatiguan, is a low and flat island about a mile in length, on which the present species breeds. As we sailed past it, we could easily observe the birds on their nests, all over the rock, which was completely white-washed with their excrement, that emitted a disagreeable odour to a great distance. I had seen several islands near the Harbour of Great Macatina inhabited by these Cormorants, but being anxious to complete the examination of one subject at a time, and knowing that we should see a greater number as we approached the Straits of Belle Isle, I put off the investigation until I should have leisure to prosecute it satisfactorily.

My son, accompanied by the captain and four sailors, sailed for Cormorant Island, on which, however, they found great difficulty in landing, for the surf broke so fearfully as to call into requisition all the judgment and good management of Mr. EMERY. The moment they landed, almost all the birds of the island rose on wing, darkening the air, and alighted at some distance on the water in large bodies. They were so shy that it was not without considerable difficulty that ten of them were obtained. At the first shot, hundreds of young ones scrambled out of their nests, and huddled together in packs of fifteen or twenty. When the men approached them, they opened their bills, squeaked, hissed, and puffed in a most outrageous manner; and the noise produced by the multitudes on the island was not merely disagreeable, but really shocking. Some of the nests contained eggs, and the young were of all sizes, from the newly hatched up to those able to fly; none, nowever, even of the largest, attempted to gain the water, but all preferred hiding themselves in the fissures of the rocks, or behind the nests. It was

curious to see them crawl flat on the rock, assisting themselves with their bill, feet and wings, employing the first in the manner of Parrots, and the wings like the oars of a boat or the flappers of turtles. When approached, they curved and twisted their necks in the most curious manner, reminding one of the writhings of a snake, and when seized they muted so profusely as to excite disgust. A dozen or more of different sizes, however, were thrust into a bag, and carried on board the vessel. The materials and dimensions of the nests were noted on the spot, and a hatful of eggs was brought to me.

The Double-crested Cormorant forms its nest of sea-weeds, some sticks, moss, and clods of earth, with grass adhering to them, which it piles up into a solid mass, often as high as three feet from the rock, with a diameter of fifteen or eighteen inches at the top, and of two and a half feet at the base. The whole has an appearance of solidity seldom seen in the nests of water-birds. The nests are placed as near each other as the nature of the ground will permit, and a great number which appeared to have stood out against the winter storms, had been enlarged and repaired that season. Many, however, lay scattered over the rocks, having been demolished by heavy gales or the breaking of the surf during tempests. The whole surface of the rock resembled a mass of putridity: feathers, broken and rotten eggs, and dead young, lay scattered over it; and I leave you to guess how such a place must smell in a calm warm day. The eggs are three or four, average two and a half inches in length by one inch and four and a half eighths in breadth, and have an elongated form. They are covered with a calcareous coating, which is more or less soiled with filth, but when carefully scraped, shows a fine light greenish-blue tint.

The young, when just hatched, are of a bluish-black colour, tinged with purple, and look extremely odd. They remain blind for several days, and for about a fortnight are fed by the parents with the greatest care, the food being regurgitated into their open throats. They appear to grow rapidly, for in the course of eight or ten days we found some the size of a pullet, which, when marked, were scarcely half that size. They are covered with long down of a brownish-black colour, and do not leave the nest, unless they are intruded on, until they are able to fly, when their parents, who long before had ceased to feed them by dropping the fish into their bill, and had merely placed it on the ground near them, leave them to shift for themselves. By the middle of August all these birds remove southward, along Newfoundland, by Cape Breton Island, and the shores of Nova Scotia, scarcely any remaining on the coast of the first during winter, when indeed not many are seen farther east than the Bay of Halifax.

The fishermen and eggers never gather their eggs, they being unfit for being eaten by any other animals than Gulls or Jagers; but they commit

great havoc among the young, which they salt for food or bait. The old birds are too shy to be killed in great numbers, otherwise their feathers, although they smell strongly of fish, might be turned to account. I have never eaten Cormorant's flesh, and intend to refrain from tasting it until nothing better can be procured.

The flight of this species is strong and well sustained, although not so rapid as that of the Florida Cormorant. It sails at times in a beautiful manner, and at a great height above the waters. Like other species, the Double-crested Cormorants are fond of sunning themselves, with their wings spread out. They walk awkwardly, and cannot run without the aid of their wings. In order to arise from the water, in which they sink so as nearly to be covered when swimming, they are obliged to run and beat the surface for many yards, before they get fairly on wing. Their food consists of shrimps, lents, capelings, codlings, and other fishes, scarcely any kind coming amiss unless too strong or of too great a size. Of the codlings especially they devour vast numbers, they being in astonishing shoals on the coast of Labrador at the time when the Cormorants are breeding, and indeed remaining until the departure of the birds, when they retire to deeper water. I never saw a Cormorant plunge from the air after its prey, but should be much gratified by such a sight, which, if we trust compilers, is nothing uncommon; nor have I ever seen a bird of this species perched on anything higher than the top of the low island on which the nest is placed, none having been observed by me on any of the high rocks on which the common species breeds in America.

I have given the figure of a beautiful male in its perfect spring plumage. This is probably the only representation of the bird yet presented to the public, and the same remark applies to the Florida Cormorant.

PELECANUS (CARBO) DILOPHUS, *Double-crested Cormorant*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 473.

DOUBLE-CRESTED CORMORANT, Nutt. Man., vol. ii. p. 483.

DOUBLE-CRESTED CORMORANT, *Phalacrocorax dilophus*, Aud. Orn. Biog., vol. iii. p. 420; vol. v. p. 629.

Male, 33, 51.

Common as far south as the coast of Maryland, in winter. Breeds in Newfoundland and Labrador, as well as on the Saskatchewan.

Adult Male at the commencement of the breeding season.

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 curved, 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. Lower mandible with the angle long and very narrow towards the end, filled by an extensive 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 rather slender. Body 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.

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 loose glossy margins. From behind the eye to the length of an inch and a half on each side, an elongated tuft of long slender, loose recurved 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 dusky, along the edges greyish-yellow; lower yellow, irregularly marked with dusky towards the edges. Iris bright green, margin of eyelids, bare space on the head, and gular sac, rich orange. Feet and claws 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, their fringe-like margins greenish-black; primary quills brownish-black; secondary like the other feathers of the wing. Tail black, the shafts of all the feathers black.

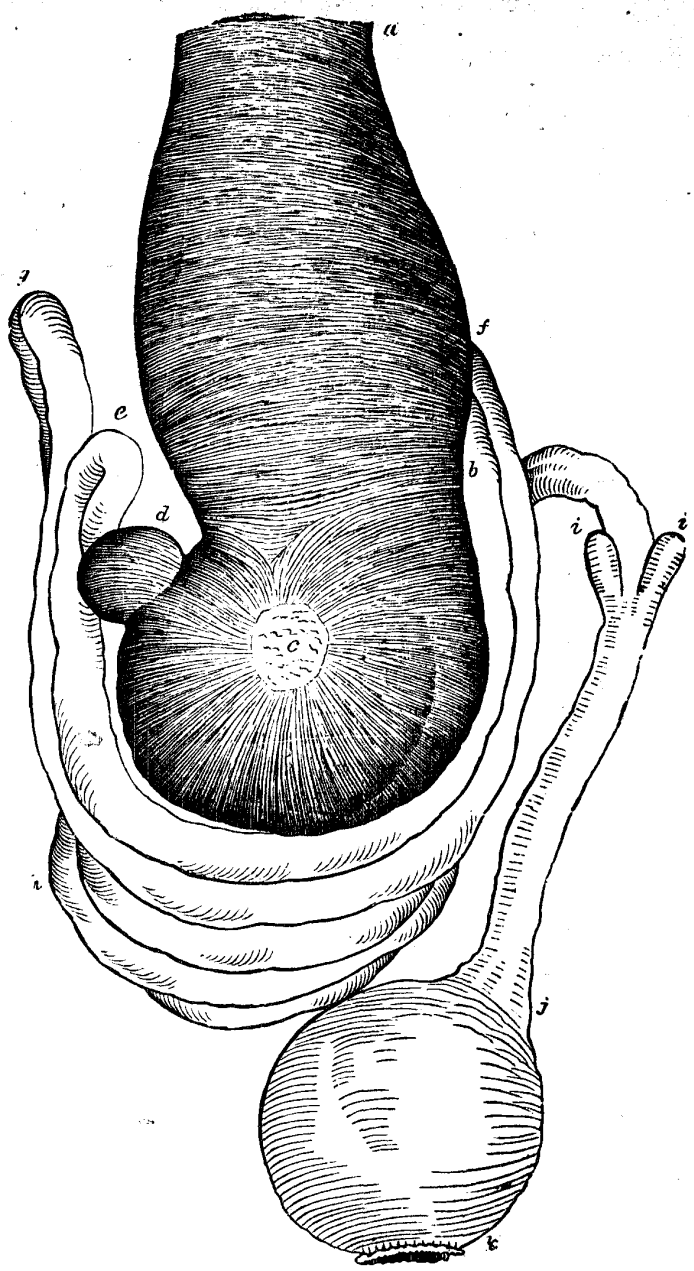
Length to end of tail 33 inches, to end of wings 29, to end of claws 33; extent of wings 51; wing from flexure 13; tail 6¾; bill along the back $2\frac{8}{12}$, along the edge of lower mandible $3\frac{8}{12}$; tarsus $2\frac{7}{12}$; outer toe 3¾, its claw $\frac{11}{12}$. Weight 5 lbs. 7 oz.

The Female is somewhat smaller, but in other respects is similar to the male.

The Young, after the first moult, have the head and neck mottled with greenish-black and greyish-brown; the other parts as in the adult, but the tufts on the head wanting.

The Double-crested and the Florida Cormorants are very nearly allied, their forms, and the structure of their plumage, being precisely similar. There is, however, a very considerable difference in size, as will be seen on comparing their measurements and average weights as given by me. The bills are similar in form, but their colours differ, as do those of the eyelids; but in the breeding season these birds may readily be distinguished by the temporary tufts or crests behind the eyes, which in *P. floridanus* consist of a mere line of single feathers curved downwards, while in *P. dilophus* they are of considerable breadth, and composed of about forty recurved feathers. In the absence of the crests, the difference in size affords the principal means of distinguishing them.

Female. The mouth of this bird, and those of the other Cormorants, differ from those of all the birds hitherto examined and described in these volumes, in having the posterior aperture of the nares placed much farther forward, commencing nearly opposite the anterior angle of the eye, and in this species only 10 twelfths long, with a very prominent ridge on each side, running backwards over the hind part of the palate, which is flattened. The width of the mouth is 1 inch 4 twelfths; but the lower jaw can be dilated to 2 inches, there being a joint on each side at the base, as in Herons. The tongue is a very diminutive ovato-lanceolate, thin, strongly carinate body, ¼ inch in length, 3 twelfths in its greatest breadth, with two basal knobs placed close together. Œsophagus 16 inches long, at its commencement 2¼ inches in width, afterwards 2 inches; contracting to 1¼ inches as it enters the thorax, and again dilated into a sac 2¼ inches in width, *a b*, which is directly continuous with the stomach, that organ seeming to form its fundus. Its muscular fibres are very distinct, the external being transverse, the internal longitudinal; the inner coat is thrown into prominent longitudinal plicæ. The stomach, *b c d*, is of a roundish form, 2 inches 2 twelfths in diameter; its muscular coat extremely thin, being reduced to a single series of slender muscular fibres; the inner coat quite smooth and soft, as is that of the pyloric lobe, *d*, which is ½ inch in diameter. The proventricular glands, which are very numerous, form a belt, of which the greatest breadth is 1 inch 9 twelfths, but at one place only 1½ inches. The lobes of the liver are extremely unequal, the right being 4 inches, the left only 2; the gall-bladder 1 inch 9 twelfths in length, oblong, 4 twelfths in breadth. The duodenum, *d e f g*, which is 3½ twelfths in breadth, curves upwards at first to the length of 9 twelfths, *d e*, then bends round the stomach, ascends on the left side to the upper part of the proventriculus for the length of 6½ inches, retraces the same course until it reaches the liver, then passes down the right side, and is convoluted, forming twelve turns in all. It measures 5 feet 10 inches in length; its width in the duodenal part is 4¼ twelfths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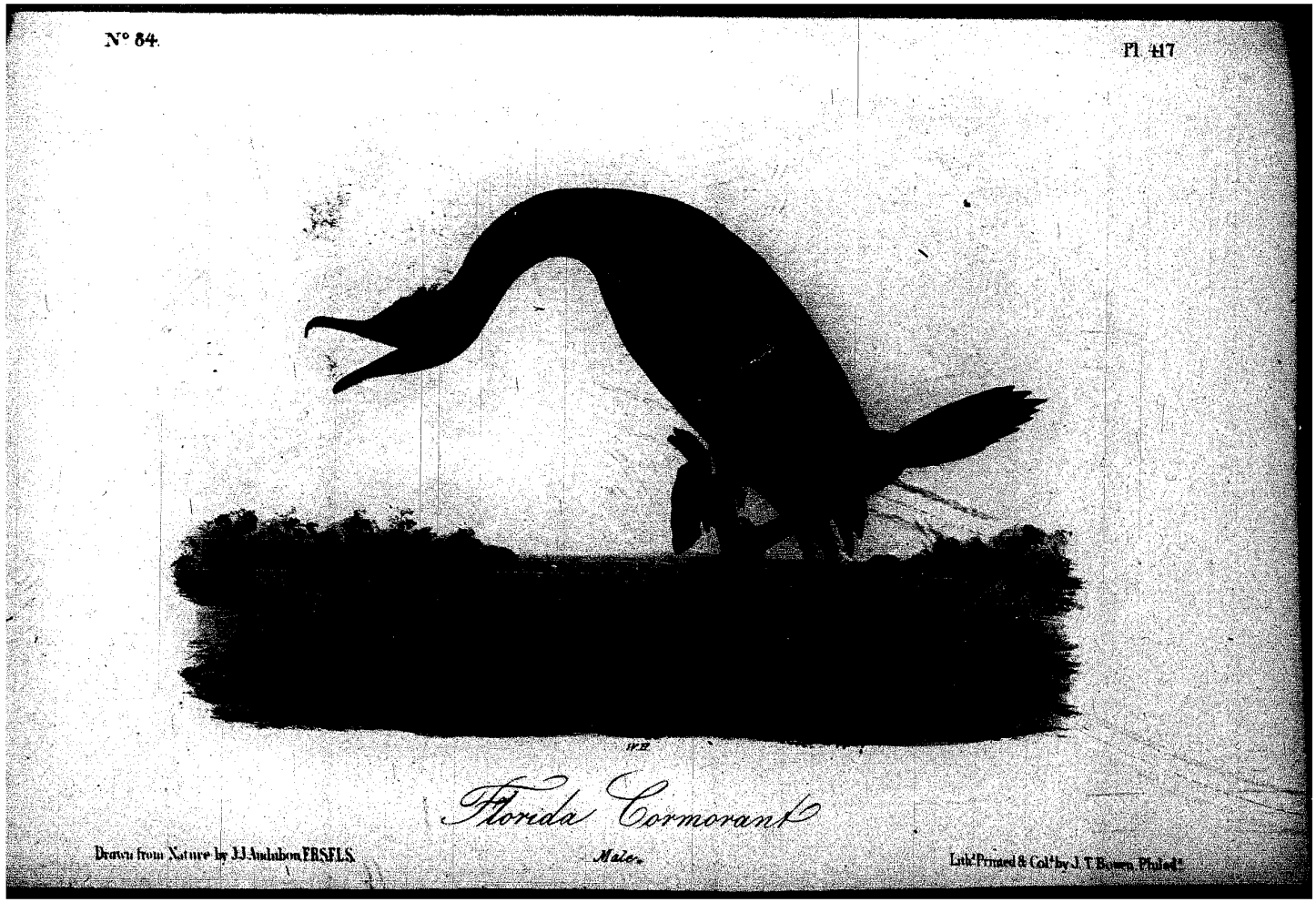
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Pl. 417
Florida Cormorant
Drawn from Nature by J.J.Audubon F.R.S.F.L.S.
Male.
Lith.d Printed & Col.d by J. T. Bowen, Phila.a

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 4½ twelfths, and terminates in a globular cloaca, *k*, 1 inch 10 twelfths in width.

The trachea is 11 inches long, from 5½ twelfths to 4½ 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 10½ 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 fifth 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

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 Gillemots 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 anywhere, 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 gumbo 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, 29¼, 46½.

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 29¾ inches, to end of wings 25½, to end of claws 28½; extent of wings 46½; wing from flexure 11¾; 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 $1\frac{1}{2}$. Weight 3½ 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.

Townsend's Cormorant

Male.

Drawn from Nature by J.J. Audubon FRSFLS

Lith. Printed & Col.d by J.T. Bowen, Philad.a

TOWNSEND'S CORMORANT.

PHALACROCORAX TOWNSENDI, *Aud.*

PLATE CCCCXVIII.—MALE.

Two specimens of the Cormorant here represented were sent to me by Mr. TOWNSEND, who procured them at Cape Disappointment in the beginning of October, 1836. They are both marked as males, and agree nearly in colour, but differ somewhat in the length of the bill, and in the extent of the bare space at its base. One of them seems to be in its first plumage, the other in that of the adult. Nothing, I believe, is known of the distribution or habits of this species, which I have honoured with the name of its discoverer.

PHALACROCORAX TOWNSENDI, *Townsend's Cormorant*, Aud. Orn. Biog., vol. v. p. 149.

Male, 35; wing, 12½; tail 6¾.

Cape Disappointment, Columbia river. Common.

Male.

Bill about the length of the head, rather slender, nearly straight, compressed toward the end. Upper mandible with the dorsal line considerably concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edges sharp and nearly straight as far as the unguis, which is decurved, convex above, acute, its tip extending nearly a quarter of an inch beyond the level of the dorsal outline of the lower mandible. No external nostrils. Lower mandible with the angle long and very narrow towards the end, filled up by an extensible membrane, which extends to the level of the angle of the mouth, the outline of the crura very slightly convex, that of the terminal part descending and slightly convex, the sides convex, the edges sharp and inflected, the tip compressed, with its marginal outline decurved.

Head rather small, oblong. Neck long, and rather thick. Body full, elongated, and depressed. Feet short, stout, placed far behind; tibia feathered in its whole length; tarsus very short, strong, much compressed, covered all round with angular scales, of which the anterior are larger, a series on part of the inner side anteriorly, and another on the lower part of the outer,

scutelliform. Toes all placed in the same plane, connected by reticulated webs, and covered above with numerous broad but very short oblique scutella; first toe smallest, fourth longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge.

Plumage soft, generally blended, compact on the back and wings, glossy on the head, hind neck, and rump; the feathers on the head and neck oblong, on the back ovato-elliptical. The small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings of moderate size, broad; primaries curved, pointed, the first, second, and third with the inner web cut out toward the end, the first three and a half twelfths shorter than the second, which is longest, but exceeds the third only by one twelfth; secondaries long and rounded. Tail of moderate length, very narrow, much rounded, or cuneate, of twelve narrow strong-shafted feathers.

Bill yellow, with the ridge brown; gular sac and bare skin about the eyes orange. The upper part of the head and hind neck are dusky, tinged with green, the hind part of the back greenish-black; the rest of the upper parts brownish-grey, each feather margined with black. The quills are also brownish-grey, edged with black, the outer primaries and the tail-feathers black. The sides of the head, the fore part of the neck, and the breast light yellowish-brown, the middle of the neck in front darker, the sides, abdomen, and tibial feathers, shaded into brownish-black, tinged with green. On the sides of the neck and on the hind part of the sides of the body are a few scattered white piliform feathers with a terminal pencil of filaments.

Length to end of tail 35 inches; bill along the ridge $2\frac{1}{2}$; along the edge of lower mandible $3\frac{4}{12}$; wing from flexure $12\frac{1}{2}$; tail $6\frac{9}{12}$; tarsus $2\frac{1}{2}$; first toe 1, its claw $\frac{7}{12}$; second toe $1\frac{8}{12}$, its claw $\frac{6}{12}$; hind toe $2\frac{8}{12}$, its claw $\frac{6}{12}$; fourth toe $3\frac{1}{2}$, its claw $\frac{5}{12}$.

Another individual, apparently a bird in its first plumage, has the head and upper part of the fore neck darker, the middle of the breast lighter, the feathers on the back margined with greyish-brown and an inner band of dark brown. Its bill is longer, but more slender, the unguis less curved, the feathers not entirely obliterated from the space before the eye, and extending farther on the gular sac. It is obviously however of the same species.

Violet-green Cormorant.

Female in Winter.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.ed Printed & Col.d by J.T.Bowen, Philad.a

VIOLET-GREEN CORMORANT.

PHALACROCORAX RESPLENDENS, *Aud.*

PLATE CCCCXIX.—ADULT.

This Cormorant, the most beautiful hitherto found within the limits of the United States, was obtained by Mr. TOWNSEND at Cape Disappointment, near the entrance of the Columbia river. The specimen from which the figure in the plate was taken, was transmitted to me by that zealous student of Nature. The beautiful gloss of its silky plumage suggested the specific name which I have given to it.

VIOLET-GREEN CORMORANT, *Phalacrocorax resplendens*, Aud. Orn. Biog., vol. v. p. 148

Female, 27 ; wing 10 ; tail 5½.

Cape Disappointment, near Columbia river. Abundant.

Adult.

Bill about the length of the head, slender, cylindrical, enlarged at the base, and compressed toward the end, straight. Upper mandible with the dorsal line very slightly concave, until on the unguis, where it is decurved, the ridge convex, flattened toward the end, separated from the sides by a narrow groove, the sides convex, the edges sharp and straight as far as the unguis, which is decurved, convex above, acute, its tip not extending beyond the level of the dorsal outline of the lower mandible. No external nostrils. Lower mandible with the angle long and very narrow towards the end, filled up by an extensile membrane which does not extend beyond the level of the eye, its very short dorsal line considerably convex, the sides erect and very convex, the edges sharp and inflected, the tip compressed and truncate.

Head small, oblong. Neck long and slender. Body rather full, elongated, and 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 a series on the inner side anteriorly, and another on the outer, are scutelliform, the posterior very small and roundish. Toes all placed in the same plane, connected by reticulated webs, and covered above with numerous broad but very short oblique scutella ; first toe smallest,

fourth longest. Claws rather small, strong, compressed, acute, convex above, arched, that of the third toe pectinated on its inner edge.

Plumage silky, being very soft, blended, and highly glossed. Feathers of the head and neck oblong of the other parts ovate and rounded. The small gular sac, and the space before and beneath the eye, with the eyelids, bare. Wings rather small, broad; primaries curved; in the only individual in my possession, in which they are not fully developed, the first is an inch and four and a half twelfths shorter than the second, which is longest, but exceeds the third only by a twelfth; secondaries broadly rounded. Tail of moderate length, very narrow, much rounded or cuneate, lateral feathers being an inch and ten-twelfths shorter than the middle; the feathers, twelve in number, are narrow, with very strong shafts.

Bill dusky, gular sac and bare skin about the eyes orange. Iris light green. Feet black. The general colour of the plumage is deep green, seeming black in some lights, and bright green and purple in others. Along the sides of the neck and the hind part of the sides of the body, are scattered numerous white piliform feathers, terminated by a pencil of filaments. The quills and tail-feathers are brownish-black, and less glossy.

Length to end of tail 27 inches; bill along the ridge $1\frac{8}{12}$, along the edge of lower mandible $2\frac{8}{12}$; wing from flexure 10; tail $5\frac{1}{2}$; tarsus $1\frac{9}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{4}{12}$; second toe $1\frac{7}{12}$, its claw $\frac{4}{12}$; third toe $2\frac{1}{4}$, its claw $\frac{9}{12}$; fourth toe $3\frac{3}{12}$, its claw $\frac{7}{12}$.

Genus II.—PLOTUS, *Linn.* ANHINGA.

Bill about twice the length of the head, almost straight, being very slightly recurved, rather slender, compressed, tapering to a fine point; upper mandible with the dorsal line slightly declinate, very slightly convex, the ridge convex, gradually narrowed, the sides sloping, the edges sharp, and beyond the middle cut into minute slender-pointed serratures directed backwards, the tip acuminate; lower mandible with the angle very long and narrow, the dorsal line beyond it straight and ascending, the sides sloping slightly outwards, the edges sharp and serrated, the point extremely narrow; gap-line ascending towards the end. No external nostrils in the adult. Head very small, oblong; neck very long and slender; body elongated and slender. Feet very short and stout: tibia feathered to the point; tarsus very short, roundish, reticulated; toes all connected by webs, the first of moderate length, the fourth longest, the first toe and the first phalanges of the rest with transverse series of scales, the rest of their extent scutellate. Claws rather large, very strong, compressed, curved, very acute, the third with parallel slits on the inner edge. A bare space at the base of the upper mandible, including the eye; skin of the throat bare and dilated, as in the Cormorants. Plumage close, blended, silky, the feathers oblong; scapulars elongated, lanceolate, compact, the outer web of the largest undulated. Wings of moderate length and breadth; third quill longest, inner secondaries elongated and resembling the posterior scapulars. Tail very long, narrow, of twelve straight feathers, having very strong shafts, and increasing in breadth to the end. Tongue a slight oblong knob; œsophagus very wide; proventricular glands placed on the right side in the form of a globular sac; stomach roundish, of moderate size, rather thin, with its inner coat soft and smooth; a large roundish pyloric lobe; intestine long and very slender; no cœca, but a small rounded termination to the rectum.

AMERICAN ANHINGA OR SNAKE-BIRD.

PLOTUS ANHINGA, *Linn.*

PLATE CCCCXX.—MALE AND FEMALE.

The Snake-bird is a constant resident in the Floridas, and the lower parts of Louisiana, Alabama, and Georgia. Few remain during winter in South Carolina, or in any district to the eastward of that State; but some proceed as far as North Carolina in spring, and breed along the coast. I have found it in Texas in the month of May, on the waters of Buffalo Bayou, and the St. Jacinto river, where it breeds, and where, as I was told, it spends the winter. It rarely ascends the Mississippi beyond the neighbourhood of Natchez, from which most of the individuals return to the mouths of that great stream, and the numerous lakes, ponds, and bayous in its vicinity, where I have observed the species at all seasons, as well as in the Floridas.

Being a bird which, by its habits, rarely fails to attract the notice of the most indifferent observer, it has received various names. The Creoles of Louisiana, about New Orleans, and as far up the Mississippi as Pointe Coupé, call it "Bec à Lancette," on account of the form of its bill; whilst at the mouths of the river it bears the name of "Water Crow." In the southern parts of Florida, it is called the "Grecian Lady," and in South Carolina it is best known by the name of "Cormorant." Yet in all these parts, it bears also the name of "Snake-bird;" but it is nowhere with us called the "Black-bellied Darter," which, by the way, could only be with strict propriety applied to the adult male.

Those which, on the one hand, ascend the Mississippi, and, on the other, visit the Carolinas, arrive at their several places of resort early in April, in some seasons even in March, and there remain until the beginning of November. Although this bird is occasionally seen in the immediate vicinity of the sea, and at times breeds not far from it, I never met with an individual fishing in salt water. It gives a decided preference to rivers, lakes, bayous, or lagoons in the interior, always however in the lowest and most level parts of the country. The more retired and secluded the spot, the more willingly does the Snake-bird remain about it. Sometimes indeed I have suddenly come on some in such small ponds, which I discovered by mere accident, and in parts of woods so very secluded, that I was taken by

American Anhinga Snake Bird.

1. Male. 2. Female.

surprise on seeing them. The Floridas therefore are peculiarly adapted for this species, as there the torpid waters of the streams, bayous, and lakes, are most abundantly supplied with various species of fish, reptiles, and insects, while the temperature is at all seasons congenial, and their exemption from annoyance almost unparalleled. Wherever similar situations occur in other parts of the Southern States, there the Anhingas are met with in numbers proportioned to the extent of the favourable localities. It is very seldom indeed that any are seen on rapid streams, and more especially on clear water, a single instance of such an occurrence being all that I have observed. Wherever you may chance to find this bird, you will perceive that it has not left itself without the means of escape; you will never find one in a pond or bayou completely enclosed by tall trees, so as to obstruct its passage; but will observe that it generally prefers ponds or lakes surrounded by deep and almost impenetrable morasses, and having a few large trees growing out of the water near their centre, from the branches of which they can easily mark the approach of an enemy, and make their escape in good time. Unlike the Fish-hawk and King-fisher, the Anhinga however never plunges or dives from an eminence in procuring its prey, although from its habit of occasionally dropping in silence to the water from its perch, for the purpose of afterwards swimming about and diving in the manner of the Cormorant, some writers have been led to believe that it does so.

The Black-bellied Darter, all whose names I shall use, for the purpose of avoiding irksome repetitions, may be considered as indefinitely gregarious; by which I mean that you may see eight or more together at times, during winter especially, or only two, as in the breeding season. On a few occasions, whilst in the interior of the southernmost parts of Florida, I saw about thirty individuals on the same lake. While exploring the St. John's river of that country in its whole length, I sometimes saw several hundreds together. I procured a great number on that stream, on the lakes in its neighbourhood, and also on those near the plantation of Mr. BULOW, on the eastern side of the Peninsula. I observed that the young Darters, as well as those of the Cormorants, Herons, and many other birds, kept apart from the old individuals, which they however joined in spring, when they had attained their full beauty of plumage.

The Anhinga is altogether a diurnal bird, and, like the Cormorant, is fond of returning to the same roosting place every evening about dusk, unless prevented by molestation. At times I have seen from three to seven alight on the dead top branches of a tall tree, for the purpose of there spending the night; and this they repeated for several weeks, until on my having killed some of them and wounded others, the rest abandoned the spot, and after several furious contests with a party that roosted about two miles off,

succeeded in establishing themselves among them. At such times they seldom sit very near each other, as Cormorants do, but keep at a distance of a few feet or yards, according to the nature of the branches. Whilst asleep, they stand with the body almost erect, but never bend the tarsus so as to apply it in its whole length, as the Cormorant does; they keep their head snugly covered among their scapulars, and at times emit a wheezing sound, which I supposed to be produced by their breathing. In rainy weather they often remain roosted the greater part of the day, and on such occasions they stand erect, with their neck and head stretched upwards, remaining perfectly motionless, as if to allow the water to glide off their plumage. Now and then, however, they suddenly ruffle their feathers, violently shake themselves, and again compressing their form, resume their singular position.

Their disposition to return to the same roosting places is so decided that, when chased from their places of resort, they seldom fail to betake themselves to them during the day; and in this manner they may easily be procured with some care. Whilst at Mr. BULOW'S, I was almost daily in the habit of visiting a long, tortuous bayou, many miles in extent, which at that season (winter) was abundantly supplied with Anhingas. There the Otter, the Alligator, and many species of birds, found an ample supply of food; and as I was constantly watching them, I soon discovered a roosting place of the Snake-birds, which was a large dead tree. I found it impossible to get near them either by cautiously advancing in the boat, or by creeping among the briars, canes, and tangled palmettoes which profusely covered the banks. I therefore paddled directly to the place, accompanied by my faithful and sagacious Newfoundland dog. At my approach the birds flew off towards the upper parts of the stream, and as I knew that they might remain for hours, I had a boat sent after them with orders to the Negroes to start all that they could see. Dragging up my little bark, I then hid myself among the tangled plants, and, with my eyes bent on the dead tree, and my gun in readiness, I remained until I saw the beautiful bird alight and gaze around to see if all was right. Alas! it was not aware of its danger, but, after a few moments, during which I noted its curious motions, it fell dead into the water, while the reverberations consequent on the discharge of my gun alarmed the birds around, and by looking either up or down the bayou I could see many Anhingas speeding away to other parts. My dog, as obedient as the most submissive of servants, never stirred until ordered, when he would walk cautiously into the water, swim up to the dead bird, and having brought it to me, lie down gently in his place. In this manner, in the course of one day I procured fourteen of these birds, and wounded several others. I may here at once tell you that all the roosting places of the Anhinga which I have seen were over the water, either on the shore or

in the midst of some stagnant pool; and this situation they seem to select because there they can enjoy the first gladdening rays of the morning sun, or bask in the blaze of its noontide splendour, and also observe with greater ease the approach of their enemies, as they betake themselves to it after feeding, and remain there until hunger urges them to fly off. There, trusting to the extraordinary keenness of their beautiful bright eyes in spying the marauding sons of the forest, or the not less dangerous enthusiast, who, probably like yourself, would venture through mud and slime up to his very neck, to get within rifle shot of a bird so remarkable in form and manners, the Anhingas, or "Grecian Ladies," stand erect, with their wings and tail fully or partially spread out in the sunshine, whilst their long slender necks and heads are thrown as it were in every direction by the most curious and sudden jerks and bendings. Their bills are open, and you see that the intense heat of the atmosphere induces them to suffer their gular pouch to hang loosely. What delightful sights and scenes these have been to me, good reader! With what anxiety have I waded toward these birds, to watch their movements, while at the same time I cooled my over-heated body, and left behind on the shores myriads of hungry sand-flies, gnats, mosquitoes, and ticks, that had annoyed me for hours!

The peculiar form, long wings, and large fan-like tail of the Anhinga, would at once induce a person looking upon it to conclude that it was intended by nature rather for protracted and powerful flight, than for spending as it does more than half of its time by day in the water, where its progress, one might suppose, would be greatly impeded by the amplitude of these parts. Yet how different from such a supposition is the fact? The Anhinga in truth is the very first of all fresh-water divers. With the quickness of thought it disappears beneath the surface, and that so as scarcely to leave a ripple on the spot; and when your anxious eyes seek around for the bird, you are astonished to find it many hundred yards distant, the head perhaps merely above water for a moment; or you may chance to perceive the bill alone gently cutting the water, and producing a line of wake not observable beyond the distance of thirty yards from where you are standing. With habits like these it easily eludes all your efforts to procure it. When shot at while perched, however severely wounded they may be, they fall at once perpendicularly, the bill downward, the wings and tail closed, and then dive and make their way under water to such a distance that they are rarely obtained. Should you, however, see them again, and set out in pursuit, they dive along the shores, attach themselves to roots of trees or plants by the feet, and so remain until life is extinct. When shot dead on the trees, they sometimes cling so firmly to the branches that you must wait some minutes before they fall.

The generally received opinion or belief that the Anhinga always swims with its body sunk beneath the surface is quite incorrect; for it does so only when in sight of an enemy, and when under no apprehension of danger it is as buoyant as any other diving bird, such as a Cormorant, a Merganser, a Grebe, or a Diver. This erroneous opinion has, however, been adopted simply because few persons have watched the bird with sufficient care. When it first observes an enemy, it immediately sinks its body deeper, in the manner of the birds just mentioned, and the nearer the danger approaches, the more does it sink, until at last it swims off with the head and neck only above the surface, when these parts, from their form and peculiar sinuous motion, somewhat resemble the head and part of the body of a snake. It is in fact from this circumstance that the Anhinga has received the name of Snake-bird. At such a time, it is seen constantly turning its head from side to side, often opening its bill as if for the purpose of inhaling a larger quantity of air, to enable it the better to dive, and remains under water so long that when it next makes its appearance it is out of your reach. When fishing in a state of security it dives precisely like a Cormorant, returns to the surface as soon as it has procured a fish or other article of food, shakes it, if it is not too large often throws it up into the air, and receiving it conveniently in the bill, swallows it at once, and recommences its search. But I doubt much if it ever seizes on anything that it cannot thus swallow whole. They have the curious habit of diving under any floating substances, such as parcels of dead weeds or leaves of trees which have accidentally been accumulated by the winds or currents, or even the green slimy substances produced by putrefaction. This habit is continued by the species when in a perfect state of domestication, for I have seen one kept by my friend JOHN BACHMAN thus diving when within a few feet of a quantity of floating rice-chaff, in one of the tide-ponds in the neighbourhood of Charleston. Like the Common Goose, it invariably depresses its head while swimming under a low bridge, or a branch or trunk of a tree hanging over the water. When it swims beneath the surface of the water, it spreads its wings partially, but does not employ them as a means of propulsion, and keeps its tail always considerably expanded, using the feet as paddles either simultaneously or alternately.

The quantity of fish consumed by this bird is astonishing, and what I am about to relate on this subject will appear equally so. One morning Dr. BACHMAN and I gave to an Anhinga a Black Fish, measuring nine and a half inches, by two inches in diameter; and although the head of the fish was considerably larger than its body, and its strong and spinous fins appeared formidable, the bird, which was then about seven months old, swallowed it entire, head foremost. It was in appearance digested in an hour and a half,

when the bird swallowed three others of somewhat smaller size. At another time, we placed before it a number of fishes about seven and a half inches long, of which it swallowed nine in succession. It would devour at a meal forty or more fishes about three inches and a half long. On several occasions it was fed on Plaice, when it swallowed some that were four inches broad, extending its throat, and compressing them during their descent into the stomach. It did not appear to relish eels, as it eat all the other sorts first, and kept them to the last; and after having swallowed them, it had great difficulty in keeping them down, but, although for awhile thwarted, it would renew its efforts, and at length master them. When taken to the tide-pond at the foot of my friend's garden, it would now and then after diving return to the surface of the water with a cray-fish in its mouth, which it pressed hard and dashed about in its bill, evidently for the purpose of maiming it, before it would attempt to swallow it, and it never caught a fish without bringing it up to subject it to the same operation.

While residing near Bayou Sara, in the State of Mississippi, I was in the habit of occasionally visiting some acquaintances residing at Pointe Coupé, nearly opposite the mouth of the bayou. One day, on entering the house of an humble settler close on the western bank of the Mississippi, I observed two young Anhingas that had been taken out of a nest containing four, which had been built on a high cypress in a lake on the eastern side of the river. They were perfectly tame and gentle, and much attached to their foster-parents, the man and woman of the house, whom they followed wherever they went. They fed with equal willingness on shrimps and fish, and when neither could be had, contented themselves with boiled Indian corn, of which they caught with great ease the grains as they were thrown one by one to them. I was afterwards informed, that when a year old, they were allowed to go to the river and fish for themselves, or to the ponds on either side, and that they regularly returned towards night for the purpose of roosting on the top of the house. Both birds were males, and in time they fought hard battles, but at last each met with a female, which it enticed to the roost on the house-top, where all the four slept at night for awhile. Soon after, the females having probably laid their eggs in the woods, they all disappeared, and were never again seen by the persons who related this curious affair.

The Anhinga moves along the branches of trees rather awkwardly; but still it walks there, with the aid of its wings, which it extends for that purpose, and not unfrequently also using its bill in the manner of a Parrot. On the land, it walks and even runs with considerable ease, certainly with more expertness than the Cormorant, though much in the same style. But it does not employ its tail to aid it, for, on the contrary, it carries that organ inclined upwards, and during its progress from one place to another, the

movements of its head and neck are continued. These movements, which, as I have said, resemble sudden jerkings of the parts to their full extent, become extremely graceful during the love season, when they are reduced to gentle curvatures. I must not forget to say, that during all these movements, the gular pouch is distended, and the bird emits rough guttural sounds. If they are courting on wing, however, in the manner of Cormorants, Hawks, and many other birds, they emit a whistling note, somewhat resembling that of some of our rapacious birds, and which may be expressed by the syllables *eek*, *eek*, *eek*, the first loudest, and the rest diminishing in strength. When they are on the water, their call-notes so much resemble the rough grunting cries of the Florida Cormorant, that I have often mistaken them for the latter.

The flight of the Anhinga is swift, and at times well sustained; but like the Cormorants, it has the habit of spreading its wings and tail before it leaves its perch or the surface of the water, thus frequently affording the sportsman a good opportunity of shooting it. When once on wing, they can rise to a vast height, in beautiful gyrations, varied during the love-season by zigzag lines chiefly performed by the male, as he plays around his beloved. At times they quite disappear from the gaze, lost as it were, in the upper regions of the air; and at other times, when much lower, seem to remain suspended in the same spot for several seconds. All this while, and indeed as long as they are flying, their wings are directly extended, their neck stretched to its full length, their tail more or less spread according to the movements to be performed, being closed when they descend, expanded and declined to either side when they mount. During their migratory expeditions, they beat their wings at times in the manner of the Cormorant, and at other times sail like the Turkey Buzzard and some Hawks, the former mode being more frequently observed when they are passing over an extent of woodland, the latter when over a sheet of water. If disturbed or alarmed, they fly with continuous beats of the wings, and proceed with great velocity. As they find difficulty in leaving their perch without previously expanding their wings, they are also, when about to alight, obliged to use them in supporting their body, until their feet have taken a sufficient hold of the branch on which they desire to settle. In this respect, they exactly resemble the Florida Cormorant.

The nest of the Snake-bird is variously placed in different localities; sometimes in low bushes, and even on the common smilax, not more than eight or ten feet above the water, if the place be secluded, or on the lower or top branches of the highest trees, but always over the water. In Louisiana and the State of Mississippi, where I have seen a goodly number of nests, they were generally placed on very large and tall cypresses, growing out of the central parts of lakes and ponds, or overhanging the borders of lagoons, bayous, or rivers, distant from inhabited places. They are fre-

quently placed singly, but at times amidst hundreds or even thousands of nests of several species of Herons, especially *Ardea alba*, and *A. Herodias* the Great White and Great Blue Herons. As however in all cases the form, size, and component materials are nearly the same, I will here describe a nest procured for the purpose by my friend BACHMAN.

It measured fully two feet in diameter, and was of a flattened form, much resembling that of the Florida Cormorant. The first or bottom layer was made of dry sticks of different sizes, some nearly half an inch in diameter, laid crosswise, but in a circular manner. Green branches with leaves on them, of the common myrtle, *Myrica cerifera*, a quantity of Spanish moss, and some slender roots, formed the upper and inside layer, which was as solid and compact as that of any nest of the Heron tribe. This nest contained four eggs; another examined on the same day had four young birds; a third only three; and in no instance has a nest of the Anhinga been found with either eight eggs, or "two eggs and six young ones," as mentioned by Mr. ABBOTT, of Georgia, in his notes transmitted to WILSON. Mr. ABBOTT is however correct in saying that this species "will occupy the same tree for a series of years," and I have myself known a pair to breed in the same nest three seasons, augmenting and repairing in every succeeding spring, as Cormorants and Herons are wont to do. The eggs average two inches and five-eighths in length, by one and a quarter in diameter, and are of an elongated oval form, of a dull uniform whitish colour externally, being covered with a chalky substance, beneath which the shell, on being carefully scraped, is of a light blue, precisely resembling in this respect the eggs of the different species of American Cormorants with which I am acquainted.

The young when about a fortnight old are clad with a uniform buff-coloured down; their bill is black, their feet yellowish-white, their head and neck nearly naked; and now they resemble young Cormorants, though of a different colour. The wing feathers make their appearance through the down, and are dark brown. The birds in the same nest differ as much in size as those of Cormorants, the largest being almost twice the size of the smallest. At this age they are in the habit of raising themselves by placing their bills on the upper part of the nest, or over a branch if convenient, and drawing themselves up by their jaws, which on such occasions they open very widely. This habit is continued by young birds whilst in confinement, and was also observed in the Cormorant, *Phalacrocorax Carbo*, the young of which assisted themselves with their bills while crawling about on the deck of the Ripley. The action is indeed performed by the Anhinga at all periods of its life. At an early age the young utter a low wheezing call, and at times some cries resembling those of the young of the smaller species of Herons. From birth they are fed by regurgitation, which one might suppose an irksome task to the parent birds, as during the act they open

their wings and raise their tails. I have not been able to ascertain the period of incubation, but am sure that the male and the female sit alternately, the latter however remaining much longer on the nest. Young Anhingas when approached while in the nest cling tenaciously to it, until seized, and if thrown down, they merely float on the water, and are easily captured.

When they are three weeks old, the quills and tail-feathers grow rapidly, but continue of the same dark-brown colour, and so remain until they are able to fly, when they leave the nest, although they still present a singular motley appearance, the breast and back being buff-coloured, while the wings and tail are nearly black. After the feathers of the wings and tail are nearly fully developed, those of the sides of the body and breast become visible through the down, and the bird appears more curiously mottled than before. The young male now assumes the colour of the adult female, which it retains until the beginning of October, when the breast becomes streaked with dusky; white spots shew themselves on the back, the black of which becomes more intense, and the crimpings on the two middle feathers of the tail, which have been more or less apparent from the first, are now perfect. By the middle of February, the male is in full plumage, but the eyes have not yet acquired their full colour, being only of a dull reddish-orange. In this respect also two differences are observed between the Anhinga and the Cormorants. The first is the rapid progress of the Anhinga towards maturity of plumage, the other the retaining of its complete dress through the whole of its life, no change taking place in its colours at each successive moult. The Cormorants, on the contrary, take three or four years to attain their full dress of the love season, which lasts only during that period of excitement. The progress of the plumage in the female Anhinga is as rapid as in the male, and the tints also remain unaltered through each successive moult.

Like all other carnivorous and piscivorous birds, the Anhinga can remain days and nights without food, apparently without being much incommoded. When overtaken on being wounded, and especially if brought to the ground, it seems to regard its enemies without fear. On several occasions of this kind, I have seen it watch my approach, or that of my dog, standing as erect as it could under the pain of its wounds, with its head drawn back, its bill open, and its throat swelled with anger until, when at a sure distance, it would dart its head forward and give a severe wound. One which had thus struck at my dog's nose, hung to it until dragged to my feet over a space of thirty paces. When seized by the neck, they scratch severely with their sharp claws, and beat their wings about you with much more vigour than you would suppose they could possess.

The substances which I have found in many individuals of this species were fishes of various kinds, aquatic insects, crays, leeches, shrimps, tadpoles,

eggs of frogs, water-lizards, young alligators, water-snakes, and small terrapins. I never observed any sand or gravel in the stomach. On some occasions I found it distended to the utmost, and, as I have already stated, the bird has great powers of digestion. Its excrements are voided in a liquid state, and squirted to a considerable distance, as in Cormorants, Hawks, and all birds of prey.

The flesh of the Anhinga, after the bird is grown, is dark, firm, oily, and unfit for food, with the exception of the smaller pectoral muscles of the female, which are white and delicate. The crimpings of the two middle tail-feathers become more deeply marked during the breeding season, especially in the male. When young, the female shews them only in a slight degree, and never has them so decided as the male.

PLOTUS ANHINGA, Bonap. Syn., p. 411.
BLACK-BELLIED DARTER, *Plotus melanogaster*, Wils. Amer. Orn., vol. ix. p. 75.
BLACK-BELLIED DARTER, Nutt. Man., vol. ii. p. 507.
ANHINGA or SNAKE-BIRD, *Plotus Anhinga*, Aud. Orn. Biog., vol. iv. p. 136.

Male, 35½, 44. Female, 34, 43.

Constant resident from Florida to Georgia; in summer as far east as North Carolina, and up the Mississippi to Natchez. Common.

Adult Male.

Bill about twice the length of the head, almost straight, being very slightly recurved, rather slender, compressed, tapering to a fine point. Upper mandible with the dorsal outline slightly declinate, and almost straight, being however somewhat convex, the ridge convex, gradually narrowed, the sides sloping, the edges sharp, and beyond the middle cut into minute slender-pointed serratures, which are directed backwards; the tips very slender. Lower mandible with the angle very long and narrow, the dorsal line beyond it straight and ascending, the sides sloping slightly outwards, the edges sharp and serrated like those of the upper, the point extremely narrow; the gap line slightly ascending towards the end. No external nostrils.

Head very small, oblong. Neck very long and slender. Body elongated and slender. Feet very short and stout. Tibia feathered to the joint. Tarsus very short, roundish, reticulated all over, the scales on the hind part extremely small. Toes all connected by webs; the first of moderate length, the second much longer, the fourth longest and slightly margined externally; the first toe, and the first phalanges of the rest, covered above with transverse series of scales, the rest of their extent scutellate. Claws rather large, very strong, compressed, curved, very acute; the outer smallest, the third longest, with a deep groove on the inner side, and a narrow thin edge, cut with parallel slits; those of the first and second toes nearly equal.

There is a bare space at the base of the upper mandible, including the eye; the skin of the throat is bare and dilated, like that of the Cormorants. The plumage of the head, neck, and body, is close, blended, and of a silky texture; the feathers oblong, rounded, with the filament disunited toward the end. On each side of the neck, from near the eye to half its length, is a series of elongated narrow loose feathers, a few of which are also dispersed over the back of the neck, and which in the breeding season are an inch and a quarter in length. The scapulars, which are very numerous, are elongated, lanceolate, tapering to a point, compact, stiffish, elastic, highly glossed, gradually increasing in size backwards, the outer web of the largest crimped. Wings of moderate length and breadth; primaries strong, firm, considerably curved, the third longest, the second almost as long, the first a little shorter than the fourth; the second, third, and fourth cut out on the outer web. Secondaries a little decurved, broad, rounded, and acuminate; the inner elongated, straightish, acuminate, and resembling the posterior scapulars. Tail very long, narrow, of twelve straight feathers having strong shafts, and increasing in breadth from the base to the end, which is rounded and very broad, the two middle feathers have their outer webs curiously marked with transverse alternate ridges and depressions.

Upper mandible dusky olive the edges yellow; lower mandible bright yellow, the edges and tips greenish; bare space about the eye bluish-green; gular sac bright orange. Iris bright carmine. Tarsi and toes anteriorly dusky olive, the hind parts and webs yellow; claws brownish-black. The general colour of the head, neck, and body, is glossy blackish-green; of the scapulars, wings, and tail, glossy bluish-black. The long loose feathers on the neck are purplish-white or pale lilac. The lower part of the neck behind is marked with very numerous minute oblong spots of white; which form two broad bands extending backwards, and gradually becoming more elongated, there being one along the centre of each feather including the scapulars. The smaller wing-coverts are similarly marked with broader white spots disposed in regular rows; the four last of which have merely a central line towards the tip, while the inner has a broad band extending from near the base over the outer half of the inner web, and towards the end including a portion of the outer web; the first row of small coverts and the secondary coverts are white, excepting the portion of the inner web. The five inner elongated secondaries are marked with a narrow white band, occupying the inner half of the outer web, from about an inch from their base to the extremity, near which it includes a part of the inner web. The tail-feathers tipped with a band of brownish-red, fading into white.

Length to end of tail 35¾ inches, to end of wings 30½, to end of claws 28½, to carpus 17½; extent of wings 44; wing from flexure 14; tail 11½; bill along the ridge 3¼, along the edge of lower mandible 3$\frac{15}{12}$; tarsus 1$\frac{4}{12}$; hind

toe $1\frac{1}{2}$, its claw $\frac{6}{12}$; second toe $1\frac{8}{12}$, its claw $\frac{11}{12}$; third toe $2\frac{5}{12}$, its claw $\frac{8}{12}$; fourth toe $2\frac{1}{12}$, its claw $\frac{9}{12}$. Weight $3\frac{1}{2}$ lbs.

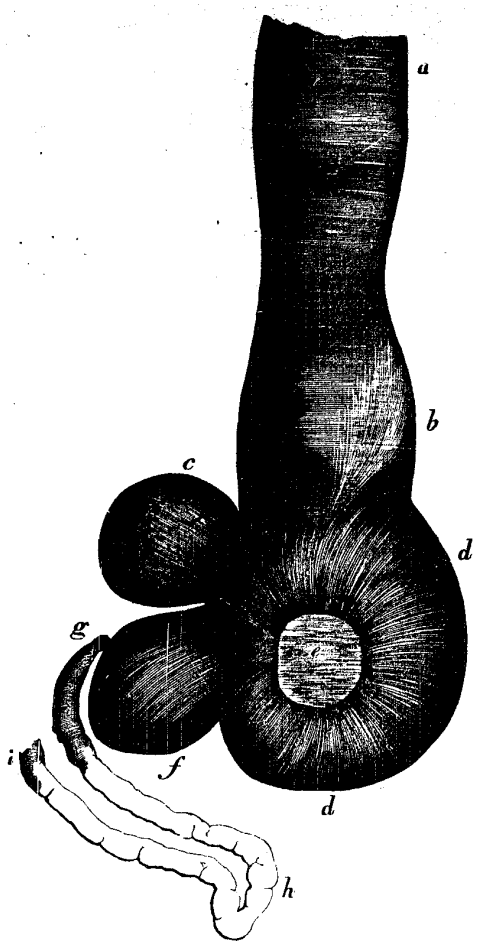
Adult Female.

The female has the plumage similar in texture to that of the male, but only a few inconspicuous elongated feathers on the neck. The bill is lighter than in the male, the naked part around the eye darker, the eye and gular sac as in the male; as are the feet. The upper part of the head and the hind neck are dull greenish-brown, lighter at the lower part, the fore part of the neck is pale reddish-brown, tinged with grey, lighter on the throat; this colour extends over part of the breast, an inch and a half beyond the carpal joint, and terminates abruptly in a transverse band of deep reddish-chestnut; the rest of the lower parts as in the male, as are the upper, only the fore part of the back is tinged with brown, and its spots less distinct.

Length to end of tail 34 inches, to end of wings $29\frac{1}{4}$, to end of claws $27\frac{1}{4}$; to carpal joint $16\frac{1}{4}$; extent of wings 43. Weight 2 lbs. 15 oz.

In external appearance and habits the Snake-bird is very nearly allied to the Cormorants. The structure of the feet is essentially the same in both genera, as is that of the wings and tail, the latter however being more elongated in the Anhinga, in correspondence with the neck. If one might suppose a small Cormorant elongated and attenuated, with the feet rather enlarged but shortened, the head diminished in size, and the bill formed more on the model of that of a Heron, being destitute of the distinct ridge and curved unguis, he would form a pretty correct notion of this bird. Not only is the bill like that of a Heron, but the vertebræ of the neck are very similar to those of that family, and form the same abrupt curvatures between the seventh and eighth vertebræ. But all the other bones are those of the Cormorants and Pelicans. The sternum in particular is almost precisely similar to that of the Crested Cormorant, so that without entering very minutely into its description, no differences could be pointed out.

Both mandibles are concave within; the palate flat, with two longitudinal ridges; the posterior aperture of the nares linear and 9 twelfths long, the anterior or external aperture *entirely obliterated*. The lower mandible has a distinct oblique joint at about a third of its length, enabling it to be expanded to the extent of an inch and a half. The pouch, which is small, is constructed in the same manner as that of the Pelicans and Cormorants; its muscular fibres running from the lower edge of the mandible downwards and backwards, and a slender muscle passing from the anterior part of the hyoid bone to the junction of the crura of the mandible. The tongue is reduced to a more oblong knob, $1\frac{1}{2}$ twelfths long, and $\frac{1}{2}$ twelfth in height. The aperture of the glottis is 3 twelfths long, with two roundish thin edged flaps behind, destitute of papillæ. There is a small bone appended to the occipital ridge, $\frac{1}{4}$ inch in length, as in the Cormorants.



The œsophagus, *a b*, is 17 inches long, exceedingly delicate and dilatable, with external longitudinal fibres, the transverse fibres becoming stronger towards the lower parts. Its diameter when moderately dilated is $1\frac{3}{4}$ inches at the top, 1 inch farther down, at its entrance into the thorax, 9 twelfths, and finally $1\frac{1}{2}$ inches; but it may be dilated to a much greater extent. *The proventricular glands, instead of forming a belt at the lower part of the œsophagus, are placed on the right side in the form of a globular sac*, about an inch in diameter, communicating with the œsophagus, *b*, and stomach, *d*. For two inches of the lower part of the œsophagus, *b*, or at that part usually occupied by the proventriculus, the transverse muscular fibres are enlarged,

and form an abrupt margin beneath; on the inner surface there are four irregular series of large apertures of gastric glandules or crypts. The proventriculus itself, *c*, is composed of large crypts of irregular form, with very wide apertures, and covered externally with muscular fibres. The stomach, *d d*, is roundish, about an inch and three quarters in diameter, with two roundish tendinous spaces, *e*, and fasciculi, of muscular fibres; its inner coat thin, soft, and smooth. It opens by an aperture a quarter of an inch in diameter into a small sac, *f*, precisely similar to that of the Pelican, which has a muscular coat, with a soft, even, internal membrane, like that of the stomach. The pylorus has a diameter of 2 twelfths, is closed by a semilunar valve or flap, and is surrounded by a disk of radiating rugæ three-fourths of an inch in diameter. The intestine, *g h*, is 3 feet 4 inches long, its average diameter 2¼ twelfths, but only 1 twelfth at its junction with the rectum, which is 3¼ inches long, 3 twelfths in diameter. The cloaca globular, 1½ inches in diameter. There are *no cæca*, properly so called, but a *small rounded termination of the rectum*, 2 twelfths in length, as in the Herons.

The subcutaneous cellular tissue is largely developed, and the longitudinal cells on the neck are extremely large, as in Gannets and Herons. The olfactory nerve is of moderate size, and the nasal cavity is a simple compressed sac 4 twelfths in its greatest diameter. The external aperture at the ear is circular, and not more than half a twelfth in diameter.

The trachea is 13¼ inches long, much flattened, narrow at the upper extremity, where it is 2½ twelfths in breadth, enlarging gradually to 4½ twelfths, and toward the lower larynx contracting to 2½ twelfths. The rings are very slender, unossified, and feeble; their number 230; the bronchial half-rings 25. The contractor muscles moderate; sterno-tracheales; and a pair of inferior muscles going to the last ring.

In a young bird scarcely two days old, and measuring only 3¾ inches in length, the two most remarkable circumstances observed refer to the nostrils and stomach. The posterior or palatal aperture of the nares is of the same form, and proportional size, as in the adult; the nasal cavity is similar; but there is an external nasal aperture, or nostril, on each side, so small as merely to admit the mystachial bristle of a Common Squirrel. The stomach is of enormous size, occupying three-fourths of the cavity of the thorax and abdomen, being 10 twelfths of an inch long, and of an oval shape. The proventriculus is separated from the stomach and formed into a roundish lobe, as in the old bird; and beside it is the lobe or pouch appended to the stomach, and from which the duodenum comes off. Even at this very early age, the stomach was turgid with a pultaceous mass apparently composed of macerated fish, without any bones or other hard substances intermixed.

Genus III.—TACHYPETES, *Vieill.* FRIGATE-BIRD.

Bill longer than the head, strong, broader than high, unless towards the curved extremity; upper mandible with its dorsal line slightly concave, at the tip decurved, its ridge broad and nearly flat at the base, narrowed and more convex towards the end, the sides separated from the ridge by a narrow groove, convex, the edges sharp, direct, irregularly jagged, with a prominence at the commencement of the curve at the elongated, compressed, tapering, decurved point; lower mandible with the angle extremely long, narrow, the membrane bare and dilatable into a small pouch, the very short dorsal line decurved, the sides erect at the base, convex in the rest of their extent, the edges sharp, much inflected, irregularly jagged, at the tip narrow and decurved. Nostrils basal, linear, inconspicuous. Head of moderate size, oblong; neck of moderate length, stout; body rather slender. Feet very short, stout; tibia very short; tarsus extremely short, feathered; toes all placed in the same plane, and connected by short deeply emarginate webs, which run out narrow along the sides, scutellate above, first small, second shorter than fourth, third much longer. Claws strong, compressed, curved, acute, that of the third toe long, with the inner edge pectinate. Plumage compact, glossy; feathers of the head, neck, and back, lanceolate. Wings extremely long, pointed, the first quill longest; the rest rapidly diminishing; secondaries very short, the inner long and tapering. Tail very long, deeply forked, of twelve feathers. Tongue exceedingly small, fleshy, flattened; œsophagus very wide; proventricular glands forming a complete belt; stomach very small, roundish, its muscular coat thin, the inner soft and corrugated; no pyloric lobe; intestine of moderate length; cœca extremely small; cloaca globular.

Frigate Pelican. Man of War bird.

Male

THE FRIGATE PELICAN.—MAN-OF-WAR-BIRD

TACHYPETES AQUILUS, *Linn.*

PLATE CCCCXXI.—ADULT.

PREVIOUS to my visit to the Florida Keys, I had seen but few Frigate birds, and those only at some distance, while I was on the Gulf of Mexico, so that I could merely recognise them by their mode of flight. On approaching Indian Key, however, I observed several of them, and as I proceeded farther south, their numbers rapidly increased; but on the Tortugas very few were observed. This bird rarely travels farther eastward than the Bay of Charleston, in South Carolina, although it is abundant at all seasons from Cape Florida to Cape Sable, the two extreme points of the peninsula. How far south it may be found I cannot tell.

The Frigate Pelicans may be said to be as gregarious as our Vultures. You see them in small or large flocks, according to circumstances. Like our Vultures, they spend the greater part of the day on wing, searching for food; and like them also, when gorged or roosting, they collect in large flocks, either to fan themselves or to sleep close together. They are equally lazy, tyrannical, and rapacious, domineering over birds weaker than themselves, and devouring the young of every species, whenever an opportunity offers, in the absence of the parents; in a word, they are most truly Marine Vultures.

About the middle of May, a period which to me appeared very late for birds found in so warm a climate as that of the Florida Keys, the Frigate Pelicans assemble in flocks of from fifty to five hundred pairs or more. They are seen flying at a great height over the islands on which they have bred many previous seasons, courting for hours together; after which they return towards the mangroves, alight on them, and at once begin to repair the old nests or construct new ones. They pillage each other's nests of their materials, and make excursions for more to the nearest keys. They break the dry twigs of trees with ease, passing swiftly on wing, and snapping them off by a single grasp of their powerful bill. It is indeed a beautiful sight to see them when thus occupied, especially when several are so engaged, passing and repassing with the swiftness of thought over the trees whose tops are blasted; their purpose appears as if accomplished by magic.

I know only two other birds that perform the same action: one of them is the Forked-tail Hawk, the other our swift or Chimney Swallow; but neither of them is so expert as the Frigate Pelican. It sometimes happens that this bird accidentally drops a stick while travelling towards its nest, when, if this should happen over the water, it plunges after it and seizes it with its bill before it has reached the waves.

The nests are usually placed on the south side of the keys, and on such trees as hang over the water, some low, others high, several in a single tree, or only one, according to the size of the mangrove, but in some cases lining the whole side of the island. They are composed of sticks crossing each other to the height of about two inches, and are flattish, but not very large. When the birds are incubating, their long wings and tail are seen extending beyond the nest for more than a foot. The eggs are two or three, more frequently the latter number, measure two inches and seven-eighths in length, two in breadth, being thus of a rather elongated form, and have a thick smooth shell, of a greenish-white colour, frequently soiled by the filth of the nests. The young are covered with yellowish-white down, and look at first as if they had no feet. They are fed by regurgitation, but grow tardily, and do not leave the nest until they are able to follow their parents on wing.

At that period the plumage of the young females is marbled with grey and brown, with the exception of the head and the lower parts, which are white. The tail is about half the length it attains at the first moult, and is brownish-black, as are the primaries. After the first change of plumage, the wings become longer, and their flight is almost as elegant and firm as that of older birds.

The second spring plumage of this sex is brownish-black on the upper parts, that colour extending over the head and around the neck in irregular patches of brown, continued in a sharp angle towards the breast, but separated on its sides by the white that ascends on either side of the neck towards the head. The lower tail-coverts are brownish-black, as are the lower parts of the belly and flanks; the shoulders alone remaining as at first. The tail and the wings are perfect.

The third spring, the upper parts of the head and neck are of a purer brownish-black, which extends down to the extremity of the angle, as are the feathers of the belly and the lower tail-coverts, the dark colour reaching now to within five inches of the angle on the breast. The white of the intermediate space has become much purer; here and there light tints of bronze appear; the feet, which at first were dull yellow, have become of a rich reddish-orange, and the bill is pale blue. The bird is now capable of

breeding, although its full plumage is not obtained until the next moult, when the colours become glossy above, and the white of the breast pure.

The changes which the males undergo are less remarkable. They are at first, when fully fledged, entirely of the colour seen on the upper parts of the young females; and the tint is merely improved afterwards, becoming of a deeper brownish-black, and acquiring purer reflections of green, purple and bronze, which in certain lights are seen on every part of the head, neck, and body, and in very old males on the wings and tail. They also commence breeding the third spring. But I now return to the habits of this interesting bird.

The Frigate Pelican is possessed of a power of flight which I conceive superior to that of perhaps any other bird. However swiftly the Cayenne Tern, the smaller Gulls or the Jager move on wing, it seems a matter of mere sport to it to overtake any of them. The Goshawk, the Peregrine, and the Gyr Falcon, which I conceive to be the swiftest of our Hawks, are obliged to pursue their victim, should it be a Green-winged Teal or Passenger Pigeon, at times for half a mile, at the highest pitch of their speed, before they can secure them. The bird of which I speak comes from on high with the velocity of a meteor, and on nearing the object of its pursuit, which its keen eye has spied while fishing at a distance, darts on either side to cut off all retreat, and with open bill forces it to drop or disgorge the fish which it has just caught. See him now! Yonder, over the waves leaps the brilliant dolphin, as he pursues the flying-fishes, which he expects to seize the moment they drop into the water. The Frigate-bird, who has marked them, closes his wings, dives toward them, and now ascending, holds one of the tiny things across his bill. Already fifty yards above the sea, he spies a porpoise in full chase, launches towards the spot, and in passing seizes the mullet that had escaped from its dreaded foe; but now, having obtained a fish too large for his gullet, he rises, munching it all the while, as if bound for the skies. Three or four of his own tribe have watched him and observed his success. They shoot towards him on broadly extended pinions, rise in wide circles, smoothly, yet as swiftly as himself. They are now all at the same height, and each as it overtakes him, lashes him with its wings, and tugs at his prey. See! one has fairly robbed him, but before he can secure the contested fish it drops. One of the other birds has caught it, but he is pursued by all. From bill to bill, and through the air, rapidly falls the fish, until it drops quite dead on the waters, and sinks into the deep. Whatever disappointment the hungry birds feel, they seem to deserve it all.

Sights like these you may every day see, if you take ship and sail for the Florida Keys. I have more to tell you, however, and of things that to me were equally pleasing. While standing in the cool veranda of Major GLAS-

SEL of the United States army, at Key West, I observed a Frigate Pelican that had forced a Cayenne Tern, yet in sight, to drop a fish, which the broad-winged warrior had seized as it fell. This fish was rather large for the Tern, and might probably be about eight inches in length. The Frigate Pelican mounted with it across his bill about a hundred yards, and then tossing it up caught it as it fell, but not in the proper manner. He therefore dropped it, but before it had fallen many yards, caught it again. Still it was not in a good position, the weight of the head, it seemed, having prevented the bird from seizing it by that part. A second time the fish was thrown upwards, and now at last was received in a convenient manner, that is, with its head downwards, and immediately swallowed.

When the morning light gladdens the face of nature, and while the warblers are yet waiting in silence the first rays of the sun, whose appearance they will hail with songs of joy, the Frigate-bird, on extended pinions, sails from his roosting place. Slowly and gently, with retracted neck he glides, as if desirous of quietly trying the renovated strength of his wings. Toward the vast deep he moves, rising apace, and before any other bird views the bright orb emerging from the waters. Pure is the azure of the heavens, and rich the deep green of the smooth sea below; there is every prospect of the finest weather; and now the glad bird shakes his pinions; and far up into the air, far beyond the reach of man's unaided eye, he soars in his quiet but rapid flight. There he floats in the pure air, but thither can fancy alone follow him. Would that I could accompany him! But now I see him again, with half-closed wings, gently falling towards the sea. He pauses awhile, and again dives through the air. Thrice, four times, has he gradually approached the surface of the ocean; now he shakes his pinions as violently as the swordsman whirls his claymore; all is right; and he sweeps away, shooting to this side and that, in search of prey.

Mid-day has arrived, and threatening clouds obscure the horizon; the breeze, ere felt, ruffles the waters around; a thick mist advances over the deep; the sky darkens, and as the angry blasts curl the waves, the thunder mutters afar; all nature is involved in gloom, and all is in confusion, save only the Man-of-war-bird, who gallantly meets the gale. If he cannot force his way against the storm, he keeps his ground, balancing himself like a Hawk watching his prey beneath; but now the tempest rages, and rising obliquely, he shoots away, and ere long surmounts the tumultuous clouds, entering a region calm and serene, where he floats secure until the world below has resumed its tranquillity.

I have frequently observed the Frigate-bird scratch its head with its feet while on wing; and this happening one day, when the bird fell through the air, as it is accustomed to do at such times, until it came within shot, I killed

it when almost over my head, and immediately picked it up. I had been for years anxious to know what might be the use of the pectinated claws of birds; and on examining both its feet with a glass, I found the racks crammed with insects, such as occur on the bird's head, and especially around the ears. I also observed that the pectinated claws of birds of this species were much longer, flatter, and more comb-like than those of any other species with which I am acquainted. I now therefore feel convinced, that however useful this instrument may be on other occasions, it is certainly employed in cleansing parts of the skin of birds which cannot be reached by the bill.

At times these birds may be seen chasing and jostling each other as if engaged in a frolic, after which they bear away on extended wings, and fly in a direct course until out of sight. But although their flight is easy and powerful, in a degree not surpassed by any other bird, they move with great difficulty on the ground. They can rise, however, from a sand-bar, no matter how low and level it may be. At such times, as well as when sitting on the water, which it occasionally does, the bird raises its wings almost perpendicularly, spreads its tail half erect, and at the first flap of the former, and simultaneous stroke of the latter, on the ground or the water, bounces away. Its feet, however, are of little service beyond what I have mentioned, and the supporting of its body when it has alighted on a branch, on which it rarely stands very erect, although it moves sideways on it, as Parrots sometimes do. It never dives, its bill in form resembling that of the Cormorants, which also never plunge from on wing in pursuit of fish, and only dip into the water when dropping from a perch or a rock to escape danger, as the Anhingas and some other birds are also accustomed to do.

When the Frigate Pelican is in want of a dead fish, a crab, or any floating garbage suited to its appetite, it approaches the water in the manner of Gulls, holding its wings high, and beating them until the bill has performed its duty, which being accomplished, the bird immediately rises in the air and devours its prey.

These birds see well at night, although they never go to sea excepting by day. At various times I have accidentally sailed by mangrove keys on which hundreds were roosted, and apparently sound asleep, when, on my firing a gun for the purpose of starting whatever birds might be there, they would all take to wing and sail as beautifully as during day, returning to the trees as the boats proceeded. They are by no means shy; indeed they seem unaware of danger from a gun, and rarely all go off when a party is shooting at them, until a considerable number has been obtained. The only difficulty I experienced in procuring them was on account of the height to which they so soon rose on leaving the trees; but we had excellent guns, and our worthy

pilot's "Long Tom" distinguished itself above the rest. At one place, where we found many hundreds of them, they sailed for nearly half an hour over our heads, and about thirty were shot, some of them at a remarkable height, when we could hear the shot strike them, and when, as they fell to the water, the sound of their great wings whirling through the air resembled that produced by a sail flapping during a calm. When shot at and touched ever so slightly, they disgorge their food in the manner of Vultures, Gulls and some Terns; and if they have fallen and are approached, they continue to vomit the contents of their stomach, which at times are extremely putrid and nauseous. When seized, they evince little disposition to defend themselves, although ever so slightly wounded, but struggle and beat themselves until killed. Should you, however, place your fingers within their open bill, you might not withdraw them scatheless.

They are extremely silent, and the only note which I heard them utter was a rough croaking one. They devour the young of the Brown Pelican when quite small, as well as those of other birds whose nests are flat and exposed during the absence of the parent birds; but their own young suffer in the same manner from the still more voracious Turkey Buzzard. The notion that the Frigate-bird forces the Pelicans and Boobies to disgorge their prey is erroneous. The Pelican, if attacked or pursued by this bird, could alight on the water or elsewhere, and by one stroke of its sharp and powerful bill destroy the rash aggressor. The Booby would in all probability thrust its strong and pointed bill against the assailant with equal success. The Cayenne Tern, and other species of that genus, as well as several small Gulls, all abundant on the Florida coasts, are its purveyors, and them it forces to disgorge or drop their prey. Those of the deep are the dolphins, porpoises, and occasionally the sharks. Their sight is wonderfully keen, and they now and then come down from a great height to pick up a dead fish only a few inches long floating on the water. Their flesh is tough, dark, and, as food, unfit for any other person than one in a state of starvation.

TACHYPETES AQUILUS, Bonap. Syn., p. 406.
FRIGATE PELICAN, Nutt. Man., vol. ii. p. 491.
FRIGATE PELICAN, *Tachypetes Aquilus*, Aud. Orn. Biog., vol. iii. p. 495; vol. v. p. 634.

Adult, 41, 86.

Resides constantly on and about the Florida Keys, where it breeds in vast numbers on trees. Ranges over the Gulf of Mexico, Bays of Texas, but rarely seen to the eastward of North Carolina.

Adult Male.

Bill much longer than the head, strong, broader than deep, excepting

towards the curved extremity, the edges irregularly jagged. Upper mandible with the dorsal line slightly concave, at the tip decurved, its ridge broad and nearly flat at the base, narrowed and more convex towards the end, the sides separated from the ridge by a narrow groove, convex, the edges sharp and inflected, with a prominence at the commencement of the curve of the elongated compressed hooked point. Nostrils basal, linear, inconspicuous. Lower mandible with the angle extremely long, narrow, the membrane bare and dilatable into a small pouch, the very short dorsal line decurved, the sides erect at the base, convex in the rest of their extent, the edges sharp and much inflected, at the narrow tip decurved.

Head of moderate size, oblong. Neck of moderate length, stout. Body rather slender. Feet very short, stout; tibia very short; tarsus extremely short, feathered; toes all placed in the same plane, and connected by short reticulated webs with concave margins, but running narrow along the sides; they are scutellate above, broad and papillate beneath; first toe small, second shorter than fourth, third much longer than the latter. Claws strong, compressed, curved, acute, that of middle toe long, obliquely flattened, and pectinate on the inner edge.

Eyelids and gular sac, with the interior part of the neck, bare. Plumage compact, on the head, neck, breast, and back, shining. The feathers of the head, neck, and back are lanceolate and acuminate; of the breast and sides broader; of the wings small and rounded. Wings extremely long, pointed, the first quill longest, the rest rapidly diminishing; the secondaries very short, obliquely rounded and acuminate, the inner long and tapering. Tail very long, deeply forked, of twelve rounded feathers, the outer narrow and abruptly rounded.

Bill light purplish-blue, white in the middle, the curved tips dusky. Inside of mouth carmine; gular sac orange. Bare space about the eye purplish-blue; iris deep brown. Feet light carmine above, orange beneath. The general colour of the plumage is brownish-black, the head, neck, back, breast, and sides, splendent with green and purple reflections, the former predominating on the head, the latter on the back. The wings are tinged with grey, the inner secondaries and tail with brown; the shafts of the former black, of the latter brown.

I have observed in specimens which I considered to be very old, that the gular sac was covered with pustules, similar to those found at times around the base of the mandibles of the *Cathartes Aura*, and which appear to be the effects of disease, occasioned by their coming frequently in contact with putrid substances.

Length to end of tail 41 inches, to end of wings 37, to end of claws 24½; wing from flexure 25, tail 18; extent of wings 86; bill along the back 5½,

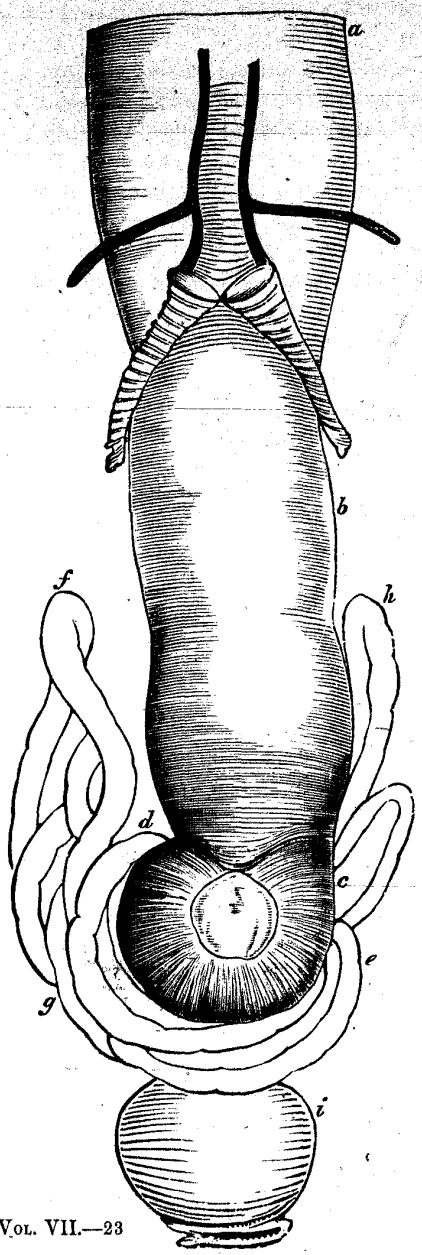
along the edge of lower mandible $5\frac{7}{12}$; tarsus $\frac{8}{12}$; middle toe $2\frac{4}{12}$, its claw $\frac{8}{12}$. Weight 3 lbs. 6 oz.

The Adult Female differs from the male in several respects. The former has the whole plumage dark-coloured, whereas the latter has a broad white space on the breast, that colour extending forwards along the sides of the neck, and encircling it about the middle. The feathers of the back are less elongated and pointed, and their lustre is much inferior to that of the male. The dark parts also are more tinged with brown, and most of the smaller wing-coverts are of the latter colour.

Male. As in the Gannets and Pelicans, the cells of the subcutaneous cellular tissue are extremely large and distensile. The mouth is very wide, its breadth being 1 inch 7 twelfths, opening to nearly beneath the posterior angle of the eye. The palate is convex, with two horny thin-edged ridges, and anteriorly a median ridge of the same kind extending to the tip. The posterior aperture of the nares is linear, $1\frac{4}{12}$ inches in length. The lower mandible is extremely narrow toward the end, and deeply grooved, with a kind of joint on each side near the base, rendering it capable of being extended to 2 inches 5 twelfths. The tongue is similar to that of the Pelicans, Gannets, and Cormorants, being exceedingly small, $7\frac{1}{2}$ twelfths in length, fleshy, flattened, $4\frac{1}{2}$ twelfths in breadth at the base, 2 twelfths at the middle, the tip obtuse. The nostrils, which are situated at the commencement of the groove on each side of the ridge, are so inconspicuous as to be with difficulty detected, being quite linear, $3\frac{1}{2}$ twelfths long, and covered above by a membranous edge. The aperture of the ear is of moderate size, 3 twelfths in width; that of the eye is $\frac{1}{2}$ inch.

The heart is of an ovate form, broader and rounder than usual, its length 1 inch $4\frac{1}{2}$ twelfths, its breadth 1 inch 2 twelfths. The lobes of the liver are very unequal, the right being 2 inches 1 twelfth long, the left 1 inch 5 twelfths; the gall-bladder oblong, 9 twelfths in length, 5 twelfths in breadth.

The œsophagus, *a b c*, is $11\frac{1}{2}$ inches long, at the commencement $2\frac{1}{2}$ inches in width, presently contracting to 1 inch 9 twelfths, at the lower part of the neck expanded to 2 inches, within the thorax 1 inch 4 twelfths; the proventriculus, *b c*, 1 inch 5 twelfths, its belt of glandules complete, 1 inch 2 twelfths in breadth, 7 prominent rugæ. The stomach, *c d*, is very small, roundish, 1 inch 4 twelfths in diameter, considerably compressed; its muscular coat very thin, consisting of a single series of fasciculi; the tendons circular, $\frac{1}{2}$ inch in diameter; its inner coat soft and corrugated, several of the proventricular rugæ running down upon it. The walls of the œsophagus are of moderate thickness, the external transverse fibres distinct, the inner coat longitudinally plaited. The stomach differs from that of all the other



Pelecaninæ in having no pyloric lobe. The duodenum also, *d e f*, does not at first pass forward, but directly curves round the stomach, returning at the distance of 2½ inches, and the intestine, *d e f g h i*, is convoluted with 9 folds. It is 36 inches long, 5 twelfths wide in the duodenal portion, contracts to 3 twelfths; the cœca are two small knobs 2 twelfths long, 1½ twelfths in breadth; the rectum 3 inches long, for 1 inch 8 twelfths its width is 3½ twelfths, the remaining part forming a globular cloaca 1½ inches in diameter.

The trachea is 8½ inches long, its width at the commencement 4½ twelfths, presently after 4 twelfths, contracting to 3½ twelfths. It is a little flattened: the rings 112, cartilaginous. The inferior larynx is greatly expanded antero-posteriorly, and the first dimidiate ring is 5 twelfths in extent, with a somewhat smaller ring beyond it. The lateral muscles are very slender; the sterno-tracheal, which passes off at the distance of ½ inch from the bifurcation, is strong; there is a slender slip on each side going to the

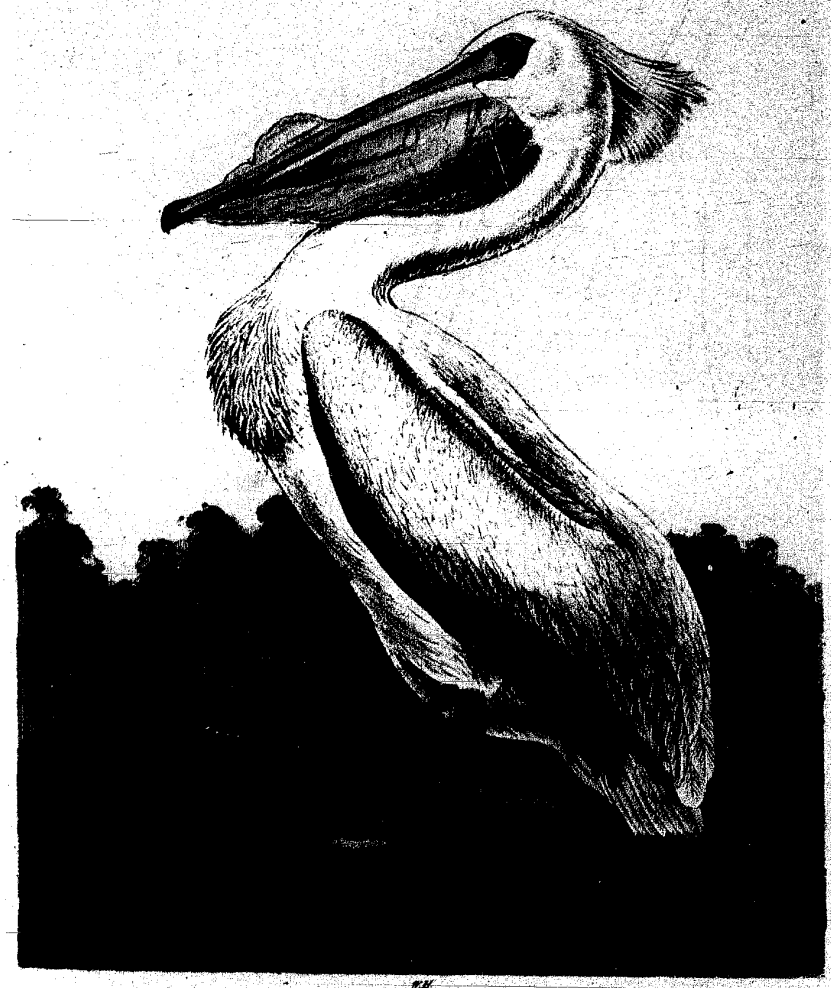
bronchial membrane. The bronchi are wide, and formed of 20 half rings.

The sternum is extremely singular, on account of its great width and concavity, compared with its length; the latter being only 2¼ inches, while the breadth at the anterior costal processes is 2½ inches. The crest is thus extremely short, but of considerable height, its most prominent part being 10½ twelfths. The coracoid bones are remarkably large, and so firmly fixed in the joint as to have just the slightest perceptible motion. The furcula is also very large and wide, of the form of the letter U, its crura at their union forming a large mass of solid bone, continuous with the crest of the sternum. The posterior edge of the sternum has a very slight sinus on each side.

Now, in this bird, which is confessed to be inferior to none in its power of flight, the sternal crest is not nearly so prominent as that of a Grouse or Partridge, so that the supposed indication which this part affords of vigorous flight is evidently fallacious. The sternum, although much shorter, resembles that of the Pelicans, Cormorants, and Anhingas, as well as in a less degree that of the Gannets.

Genus IV.—PELECANUS, *Linn.* PELICAN.

Bill about thrice the length of the head, rather slender, almost straight, depressed; upper mandible linear, depressed, convex at the base, gradually flattened, and a little enlarged to near the end, when it narrows, and terminates in a hooked point; ridge broad and convex at the base, gradually narrowed and flattened beyond the middle, separated by a groove from the sides, erect at the base, sloping towards the edges, edges very acute, with an internal groove; lower mandible with the angle excessively long, extending to the unguis, the sides erect and convex, the edges thin and involute, the tip decurved. Nostrils basal, lateral, linear, concealed by the wrinkles of the skin. Head small, oblong; neck long, stout; body full, rather flattened. Feet short, and very stout; tarsus short, compressed, covered all round with hexagonal scales; toes in the same plane, all connected by webs, first shortest fourth longer than third. Claws short, strong, curved, that of the third



American White Pelican.

Male.

toe pectinate. Feathers of head and neck exceedingly small, slender, downy; of the other parts generally lanceolate and acuminate; wings very long, rather narrow, rounded; primaries much curved. Tail short, broad, rounded, of more than sixteen feathers. An enormous bare, extensile, gular sac; tongue extremely small, papilliform; œsophagus excessively wide; proventricular glands arranged in broad longitudinal series; stomach very small, with its muscular coat thin, its epithelium smooth and soft; a globular pyloric lobe; intestine long and narrow; cœca very small, cylindrical; cloaca globular.

AMERICAN WHITE PELICAN.

PELECANUS AMERICANUS, *Aud.*

PLATE CCCCXXII.—ADULT MALE.

I feel great pleasure, good reader, in assuring you that our White Pelican, which has hitherto been considered the same as that found in Europe, is quite different. In consequence of this discovery, I have honoured it with the name of my beloved country, over the mighty streams of which, may this splendid bird wander free and unmolested to the most distant times, as it has already done from the misty ages of unknown antiquity.

In Dr. RICHARDSON'S Introduction to the second volume of the Fauna Boreali-Americana, we are informed, that the *Pelecanus Onocrotalus* (which is the bird now named *P. Americanus*) flies in dense flocks all the summer in the Fur Countries. At page 472, the same intrepid traveller says, that "Pelicans are numerous in the interior of the Fur Countries up to the sixty-first parallel; but they seldom come within two hundred miles of Hudson's Bay. They deposit their eggs usually on rocky islands, on the brink of cascades, where they can scarcely be approached; but they are otherwise by no means shy birds." My learned friend also speaks of the "long thin bony process seen on the upper mandible of the bill of this species;" and although neither he nor Mr. SWAINSON pointed out the actual differences otherwise existing between this and the European species, he states that no such appearance has been described as occurring on the bills of the White Pelicans of the old Continent.

When, somewhat more than thirty years ago, I first removed to Kentucky, Pelicans of this species were frequently seen by me on the sand-bars of the Ohio, and on the rock-bound waters of the rapids of that majestic river, situated, as you well know, between Louisville and Shippingport. Nay when, a few years afterwards, I established myself at Henderson, the White Pelicans were so abundant that I often killed several at a shot, on a well known sand-bar, which protects Canoe Creek Island, During those delightful days of my early manhood, how often have I watched them with delight! Methinks indeed, reader, those days have returned to me, as if to enable me the better once more to read the scattered notes contained in my often-searched journals.

Ranged along the margins of the sand-bar, in broken array, stand a hundred heavy-bodied Pelicans. Gorgeous tints, all autumnal, enrich the foliage of every tree around, the reflection of which, like fragments of the rainbow, seems to fill the very depths of the placid and almost sleeping waters of the Ohio. The subdued and ruddy beams of the orb of day assure me that the Indian summer has commenced, that happy season of unrivalled loveliness and serenity, symbolic of autumnal life, which to every enthusiastic lover of nature must be the purest and calmest period of his career. Pluming themselves, the gorged Pelicans patiently wait the return of hunger. Should one chance to gape, all, as if by sympathy, in succession open their long and broad mandibles, yawning lazily and ludicrously. Now, the whole length of their largest quills is passed through the bill, until at length their apparel is as beautifully trimmed as if the party were to figure at a route. But mark, the red beams of the setting sun tinge the tall tops of the forest trees; the birds experience the cravings of hunger, and to satisfy them they must now labour. Clumsily do they rise on their columnar legs, and heavily waddle to the water. But now, how changed do they seem! Lightly do they float, as they marshal themselves, and extend their line, and now their broad paddle-like feet propel them onwards. In yonder nook, the small fry are dancing in the quiet water, perhaps in their own manner bidding farewell to the orb of day, perhaps seeking something for their supper. Thousands there are, all gay, and the very manner of their mirth, causing the waters to sparkle, invites their foes to advance toward the shoal. And now the Pelicans, aware of the faculties of their scaly prey, at once spread out their broad wings, press closely forward with powerful strokes of their feet, drive the little fishes toward the shallow shore, and then, with their enormous pouches spread like so many bag-nets, scoop them out and devour them in thousands.

How strange it is, reader, that birds of this species should be found breeding in the Fur Countries, at about the same period when they are to be found

on the waters of the inland bays of the Mexican Gulf! On the 2nd of April, 1837, I met with these birds in abundance at the south-west entrance or mouth of the Mississippi, and afterwards saw them in the course of the same season, in almost every inlet, bay, or river, as I advanced toward Texas, where I found some of them in the Bay of Galveston, on the 1st of May. Nay, while on the island of Grand Terre, I was assured by Mr. ANDRY, a sugar-planter, who has resided there for some years, that he had observed White Pelicans along the shores every month of the year. Can it be, that in this species of bird, as in many others, barren individuals should remain in sections of countries altogether forsaken by those which are reproductive? The latter we know, travel to the Rocky Mountains and the Fur Countries of the north, and there breed. Or do some of these birds, as well as of certain species of our Ducks, remain and reproduce in those southern localities, induced to do so by some organic or instinctive peculiarity? Ah, reader, how little do we yet know of the wonderful combinations of Nature's arrangements, to render every individual of her creation comfortable and happy under all the circumstances in which they may be placed!

My friend JOHN BACHMAN, in a note to me, says that "this bird is now more rare on our coast than it was thirty years ago; for I have heard it stated that it formerly bred on the sand banks of our Bird Islands. I saw a flock on the Bird Banks off Bull's Island, on the 1st day of July, 1814, when I procured two full-plumaged old birds, and was under the impression that they had laid eggs on one of those banks, but the latter had the day previous to my visit been overflowed by a spring tide, accompanied with heavy wind."

A single pair of our White Pelicans were procured not far from Philadelphia, on the Delaware or Schuylkill, ten or twelve years ago, and one or two have been shot on the upper waters of the Hudson. These were the only birds of this kind that, I believe, were ever observed in our Middle Districts, where even the Brown Pelican, *Pelecanus fuscus*, is never seen. From these facts, it may be concluded that the White Pelicans reach the Fur Countries of Hudson's Bay by inland journeys, and mostly by passing along our great western rivers in the spring months, as they are also wont to do, though with less rapid movements, in autumn.

Reader, I have thought a thousand times perhaps that the present state of migration of many of our birds, is in a manner artificial, and that a portion of the myriads of Ducks, Geese, and other kinds, which leave our Southern Districts every spring for higher latitudes, were formerly in the habit of remaining and breeding in every section of the country that was found to be favourable for that purpose. It seems to me that it is now on account of the difficulties they meet with, from the constantly increasing numbers of our

hostile species, that these creatures are urged to proceed towards wild and uninhabited parts of the world, where they find that security from molestation necessary to enable them to rear their innocent progeny, but which is now denied them in countries once their own.

The White American Pelican never descends from on wing upon its prey, as is the habit of the Brown Pelican; and, although on many occasions it fishes in the manner above described, it varies its mode according to circumstances, such as a feeling of security, or the accidental meeting with shoals of fishes in such shallows as the birds can well compass. They never dive for their food, but only thrust their head into the waters as far as their neck can reach, and withdraw it as soon as they have caught something, or have missed it, for their head is seldom out of sight more than half a minute at a time. When they are upon rivers, they usually feed along the margin of the water, though, I believe, mostly in swimming depth, when they proceed with greater celerity than when on the sand. While thus swimming, you see their necks extended, with their upper mandible only above the water, the lower being laterally extended, and ready to receive whatever fish or other food may chance to come into the net-like apparatus attached to it.

As this species is often seen along the seashores searching for food, as well as on fresh water, I will give you a description of its manners there. While on the Island of Barataria in April, 1837, I one afternoon observed a number of White Pelicans swimming against the wind and current, with their wings partially extended, and the neck stretched out, the upper mandible alone appearing above the surface, while the lower must have been used as a scoop-net, as I saw it raised from time to time, and brought to meet the upper, when the whole bill immediately fell to a perpendicular position, the water was allowed to run out, and the bill being again raised upwards, the fish was swallowed. After thus swimming for about a hundred yards in an extended line, and parallel to each other, they would rise on wing, wheel about, and re-alight at the place where their fishing had commenced, when they would repeat the same actions. I continued watching them more than an hour, concealed among a large quantity of drifted logs, until their fishing was finished, when they all flew off to the lee of another island, no doubt to spend the night there, for these birds are altogether diurnal. When gorged, they retire to the shores, to small islands in bays or rivers, or sit on logs floating in shallow water, at a good distance from the beach; in all which situations they are prone to lie down, or stand closely together.

Being anxious, when on my last expedition, to procure several specimens of these birds for the purpose of presenting you with an account of their anatomical structure, I requested all on board our vessel to shoot them on all occasions; but no birds having been procured, I was obliged to set out with

a "select party" for the purpose. Having heard some of the sailors say that large flocks of White Pelicans had been seen on the inner islets of Barataria Bay, within the island called Grande Terre, we had a boat manned, and my friend EDWARD HARRIS, my son, and myself, went off in search of them. After awhile we saw large flocks of these birds on some grounded logs, but found that it was no easy matter to get near them, on account of the shallowness of the bay, the water being scarcely two feet in depth for upwards of half a mile about us. Quietly, and with all possible care, we neared a flock; and strange it was for me to be once more within shooting distance of White Pelicans. It would no doubt be a very interesting sight to you, were you to mark the gravity and sedateness of some hundreds of these Pelicans, closely huddled together on a heap of stranded logs, or a small bank of racoon oysters. They were lying on their breasts, but as we neared them they all arose deliberately to their full height. Some, gently sliding from the logs, swam off towards the nearest flock, as unapprehensive of danger as if they had been a mile distant. But now their bright eyes were distinctly visible to us, our guns, charged with buckshot, were in readiness, and my son was lying in the bow of the boat waiting for the signal. "Fire!"—The report is instantly heard, the affrighted birds spread their wings and hurry away, leaving behind three of their companions floating on the water. Another shot from a different gun brought down a fourth from on wing; and as a few were scampering off wounded, we gave chase, and soon placed all our prizes in the after sheets. About a quarter of a mile farther on, we killed two, and pursued several that were severely wounded in the wing, but they escaped, for they swam off so rapidly that we could not propel our boat with sufficient speed to catch them amidst the tortuous shallows. The Pelicans appeared tame, if not almost stupid; and at one place, where there were about sixty on an immense log, could we have gone twenty yards nearer, we might have killed eight or ten at a single discharge. But we had already a full cargo, and therefore returned to the vessel, on the decks of which the wounded birds were allowed to roam at large. We found these Pelicans hard to kill, and some which were perforated with buckshot did not expire until eight or ten minutes after they were fired at. A wonderful instance of this tenacity of life was to be seen on board a schooner then at anchor in the harbour. A Pelican had been grazed on the hind part of the head with an ounce ball from a musket, and yet five days afterwards it was apparently convalescent, and had become quite gentle. When wounded, they swim rather sluggishly, and do not attempt to dive, or even to bite, like the Brown Pelicans, although they are twice as large, and proportionally stronger. After being shot at, they are perfectly silent, but when alighted they utter a

hollow guttural sound somewhat resembling that produced by blowing through the bung-hole of a cask.

The White Pelicans appear almost inactive during the greater part of the day, fishing only soon after sunrise, and again about an hour before sunset; though at times the whole flock will mount high in the air, and perform extended gyrations in the manner of the Hooping Crane, Wood Ibis, and Vultures. These movements are probably performed for the purpose of assisting their digestion, and of airing themselves, in the higher and cooler regions of the atmosphere. Whilst on the ground, they at times spread their wings to the breeze, or to the rays of the sun; but this act is much more rarely performed by them than by the Brown Pelicans. When walking, they seem exceedingly awkward, and like many cowardly individuals of our own species, are apt to snap at objects which they appear to know perfectly to be so far superior to them as to disdain taking notice of them. Their usual manner of flight is precisely similar to that of our Brown species. It is said by authors that the White Pelican can alight on trees; but I have never seen a single instance of its doing so. I am of opinion that the ridge projecting from the upper mandible increases in size as the bird grows older, and that it uses that apparatus as a means of defence or of attack, when engaged with its rivals in the love-season.

The number of small fishes destroyed by a single bird of this species may appear to you, as it did to me, quite extraordinary. While I was at General HERNANDEZ's plantation in East Florida, one of them chanced to pass close over the house of my generous host, and was brought dead to the ground. It was not a mature bird, but apparently about eighteen months old. On opening it, we found in its stomach several hundreds of fishes, of the size of what are usually called minnows. Among the many which I have at different times examined, I never found one containing fishes as large as those commonly swallowed by the Brown species, which, in my opinion, is more likely to secure a large fish by plunging upon it from on wing, than a bird which must swim after its prey.

This beautiful species,—for, reader, it is truly beautiful, and you would say so were you to pick it up in all the natural cleanness of its plumage, from the surface of the water,—carries its crest broadly expanded, as if divided into two parts from the centre of the head. The brightness of its eyes seemed to me to rival that of the purest diamond; and in the love-season, or the spring of the year, the orange-red colour of its legs and feet, as well as of the pouch and bill, is wonderfully enriched, being as represented in my plate, while during the autumnal months these parts are pale. Its flesh is rank, fishy, and nauseous, and therefore quite unfit for food, unless in cases of extreme necessity. The idea that these birds are easily caught

when gorged with fish, is quite incorrect, for when approached, on such an occasion, they throw up their food, as Vultures are wont to do.

I regret exceedingly that I cannot say any thing respecting their nests, eggs, or young, as I have not been in the countries in which they are said to breed.

AMERICAN WHITE PELICAN, *Pelecanus americanus*, Aud. Ord. Biog., vol. iv p. 88.

Male, 61½, 103; bill, 13¾.

Common during winter from Texas to South Carolina, both along the coast and about the lakes and rivers adjoining the Missouri, Mississippi, and Ohio. Breeds from California northward to lat. 61°. Accidental in the Middle Atlantic Districts.

Adult Male.

Bill a little more than thrice the length of the head, rather slender, almost straight, depressed. Upper mandible linear, depressed, convex at the base, gradually flattened and a little enlarged to near the end, when it again narrows, and terminates in a hooked point. The ridge is broad and convex at the base, becomes gradually narrowed and flattened beyond the middle, is elevated into a thi[illegible]st about an inch high, of a fibrous structure, and about three inches in length (in some specimens as much as five inches) which is continued forwards of less elevation to the extent of an inch farther. The ridge of the mandible is then narrow and flat, and terminates in the unguis, which is oblong, slightly carinate above, curved, obtuse, concave beneath. The edges are very sharp and a little involute; the lower surface of the mandible has a median slender sharp ridge, on each side of which, at the distance of a quarter of an inch, is a stronger ridge having a groove in its whole length; the sides then slope upwards to the incurved margin, and in this latter space is received the edge of the other mandible. Lower mandible having its crura separated, very slender, elastic, and meeting only at the very extremity, so that the angle or interspace may be described as extremely long, occupying in fact the whole length of the bill excepting four-twelfths of an inch at the end; for two-thirds of its length from the base, the lower mandible is broader than the upper, which is owing to the crura lying obliquely, but beyond the crest it is narrower; the extremely short dorsal line ascending, convex, the edges inflected, sharp, and longitudinally grooved. To the lower mandible, in place of the skin or membrane filling up the angle as in most other birds, is appended a vast sac seven inches in depth opposite the base of the bill, and extending down the throat about eight inches, so that its length from the tip of the lower mandible is twenty-one and a half inches. It is formed of the skin, which is thin, transparent, elastic, rugous, highly vas

cular, and capable of being expanded like a net, supported by the elastic mandibles to the breadth of nine and a half inches.

Head small, oblong; neck long, stout; body full, rather flattened. Feet short and very stout; tibia bare at its lower part, covered all round with small scales; tarsus short, very stout, compressed, covered all round with hexagonal scales, of which the anterior are much larger; toes in the same plane, all connected by reticulated webs, the first shortest, the second an inch shorter than the fourth, which is considerably longer than the third, scaly at the base, scutellate over the rest of their extent. Claws short, strong, curved, rather blunt, that of the middle toe with a sharp pectinate inner edge.

Feathers of the head and neck exceedingly small, slender, and of a downy texture, those on the fore part of the head a little more compact; on the nape they are elongated, acuminate, and form a longitudinal narrow crest, which runs down the back of the neck. The feathers in general are lanceolate, acuminate, and of moderately dense texture; those at the junction of the neck and breast anteriorly are stiffer and more elongated. Wings very long, rather narrow, rounded; the humerus and cubitus very long in proportion; primaries much curved; secondaries rather narrow, also incurved toward the end, the inner extending when the wing is closed far beyond the tips of the primaries. Tail short, broad, rounded, of *twenty-four* feathers, which are broad and abruptly acuminate.

Bill bare, space about the eye, and feet, rich bright yellow, becoming brighter before their departure for their breeding grounds; claws yellowish-brown; tip of the bill brighter than the rest. Iris white, in younger birds dusky. The general colour of the plumage is pure white; the crest, the elongated feathers on the fore part of the breast, and those near the edge of the cubitus, pale yellow. The alula, primary coverts, and primary quills, black, the shafts white, becoming brownish-black toward the end. The inner ten secondaries are white, the rest black, more or less tipped with greyish-white, their bases white, that colour more extended on the inner than the outer, the shafts of all the quills white beneath, those of the secondaries tinged with grey.

Dimensions of an old male. Length to end of tail 61¾ inches, to end of wing 61¾, to end of claws 66¾, from the point of the bill to the carpal joint 40; extent of wings 103; wing from flexure 24½; length of cubitus 15; tail 6½; bill along the ridge 13¾, along the edge of lower mandible 15; breadth of lower mandible at the base 2; bare part of tibia 1; tarsus 4$\frac{8}{12}$; middle toe 4½, its claw $\frac{5}{8}$; outer toe 4½, its claw $\frac{6}{12}$; inner toe 3, its claw $\frac{7}{12}$; hind toe 1¾, its claw $\frac{8}{12}$. Weight 17½ lbs.

The Female is rather less, and in as far as I am warranted by the exami-

nation of several individuals in stating, is destitute of the horny crest of the upper mandible.

A male, shot near Grande Terre, in the Gulf of Mexico, examined. The skin is very thin, but the subcutaneous cellular tissue is extremely developed, forming a thick reticular layer over the whole body. The internal cells are also of vast size, the right hepatic being 4½ inches long, the right abdominal 4½ by 4; the left abdominal 5½ by 4; the clavicular cell is not formed by a single cavity, but of numberless cellules, like those of the subcutaneous tissue. The heart *n* is triangular, pointed, 3 inches long, 2 inches and 10 twelfths in breadth; the aorta branches at the base, as in other birds, sending off the two trunks which separate into the subclavian and carotid. The lobes of the liver are extremely unequal, the right, *o*, being 4 inches in length, and 2¼ in breadth, while the left, *p*, is only 2 inches long, and 1¼ inches broad.

The mandibles are entirely covered with skin, of which the subcutaneous tissue is wanting, the cutis condensed, and the cuticle in large irregular longitudinal plates, leaving the surface somewhat rough and scaly. The crest-like excrescence on the ridge of the upper mandible is not formed of bone, nor otherwise connected with the osseous surface, which is smooth and continuous beneath it, than by being placed upon it, like any other part of the skin, and when softened by immersion in a liquid may be bent a little to either side. It is composed internally of erect slender plates of a fibrous texture, externally of horny fibres, which are erect on the sides, and longitudinal on the broadened ridge; these fibres being continuous with the cutis and cuticle. The skin of the mandible is continuous with that of the pouch, of which the structure is as follows: Externally there is a layer of cuticle, beneath which is the cutis, extremely thin, and with the cuticle thrown into longitudinal rugæ when contracted. The internal surface is also of cuticle, and beneath it is a layer of cutis. Between these two very thin layers of skin, is interposed an equally thin layer, composed of two sets of very slender muscular fibres, separated from each other, and running in two opposite directions. The outer fibres run in fasciculi from the lower and inner edge of the mandible; those from its base pass downwards, those arising more anteriorly pass gradually more forwards, and spreading out, reach the middle line of the pouch. The inner fibres have the same origin, and pass in a contrary direction, backwards and inwards. From the hyoid bone to the junction of the two crura of the mandible, which takes place almost at the very tip, there extends a thin band of longitudinal muscular fibres, in the centre of which is a cord of elastic tissue. By means of this apparatus, the sac is contracted, so as to occupy little space. When the bill is opened, the crura of the lower mandible separate from each other to a considerable extent, by the action of the muscles inserted into their base, this depending upon their

oblique position, and the sac is expanded. The upper mandible is capable of being moved to a considerable extent.

Below the anterior angle of the eye is a small sac about 5 twelfths of an inch in length, with an external aperture of 2 twelfths, and filled with a pulpy substance. The nostrils are linear, about 3 twelfths of an inch long, and quite concealed by the wrinkles of the skin. The aperture of the posterior nares 8 twelfths. The tongue is an extremely small, papilliform body, 3½ twelfths of an inch long, and 1 twelfth in diameter. The aperture of the glottis is linear, 8 twelfths in length, destitute of papillæ behind.

The pharynx is about 2½ inches in breadth. The œsophagus, *a*, at the commencement, or opposite the tongue, has a diameter of about 6 inches, and contracts until the middle of the neck, where it is 3 inches in width; at its entrance into the thorax at *b* it contracts to 1½ inches, but is dilatable to 3 inches; at this part, its inner coat is thrown into very prominent longitudinal rugæ. The structure of the œsophagus is similar to that of the Loon already described, but its muscular coat is much thinner. On entering the thorax, it again expands to a diameter of 3 inches. Its length from the glottis, exclusive of the proventriculus, is 2 feet. The proventriculus, *c d*, when not extended, has a diameter of 2 inches, its length being 4 inches and 8 twelfths. It is marked internally with six longitudinal broad ridges, about half an inch in breadth, and separated by grooves; and its cuticular lining is 1½ twelfths thick, of a compact but soft texture, elevated into tortuous reticulated ridges. The glandules, which are cylindrical, the largest 3 twelfths of an inch long, ½ twelfth in diameter, form a complete elongated belt. The muscular coat is also very thick, its inner layer composed of transverse, its outer of longitudinal fibres, and the greatest thickness of the walls of

the proventriculus is about 4½ twelfths of an inch. The stomach, *e*, properly so called, is extremely small, being of a roundish, compressed form, 1¼ inches in length, and of the same breadth; its muscular coat composed of slender fasciculi, and not presenting a distinction into lateral and inferior muscles, its inner coat smooth. Appended to it on the right side is a sac, *f*, of a roundish form, $1\frac{9}{12}$ inches in length, and 1¼ in breadth, joining it by a contraction, of which the diameter is ½ inch, and opening directly into the proventriculus, as well as into the stomach; its walls thin, its inner surface smooth, with numerous mucous crypts irregularly disposed. The pylorus, *g*, is exceedingly small, 1½ twelfths in diameter, with a thickened margin.

The duodenum, *g*, *h*, *i*, passes backwards and upwards to the length of 6½ inches, returns upon itself enclosing the pancreas, receives the biliary ducts at the distance of 14 inches from the pylorus. The gall-bladder is oblong, 2 inches long, and 10 twelfths broad. The intestine then forms numerous convolutions, *j*, *k*, *l*, occupying the whole abdomen, and lying in part over the stomach and proventriculus. Its entire length is 10 feet 10 inches. Its diameter varies little, it being at the upper part 5 twelfths of an inch, towards the rectum 3½ twelfths. The rectum is 5½ inches long, including the cloaca, *m*, which is globular, and about 2½ inches in diameter. The cœca are 1 inch and 1 twelfth in length, 4 twelfths in diameter, cylindrical, rounded at the end. The muscular coat of the intestine is very strong, the inner villous.

One of the testes is 1 inch long, the other 1½; their form oblong. In the proventriculus and stomach is a vast accumulation of small lumbrici, about 1¼ inches in length, and amounting to about 1000.

The trachea is 1 foot 10 inches long, a little flattened, ½ inch in diameter throughout, but a little narrower about the middle; the rings 160, not ossified, excepting the lower. The contractor muscles are very small; as are the sterno-tracheal; and the inferior larynx is destitute of muscles. The bronchi are large, 5 twelfths in diameter, of 25 half rings.

The upper mandible is hollow in its whole extent; but the lateral spaces intervening between the edges of the median bone or ridge and the margins, are filled with a beautiful net-work of bony spiculæ. The two superior maxillary branches of the fifth pair of nerves, which are very large, being about 1 twelfth of an inch in diameter at the base, run close together along the median line, sending off branches at intervals, and extending to the end of the mandible. The lower mandible is also hollow, and similarly reticulated. The inferior maxillary branch, having entered on the inner side at the base, runs in like manner along its whole length, and is of the same thickness; by an aperture on the outer side near the base, it sends off a branch almost as thick, which runs within the membrane of the gular sac,

parallel to the mandible, and about half an inch distant from it, sending off branches at intervals. The sac is plentifully supplied with blood-vessels.

The nasal cavity is of an oblong form, 1 inch and 5 twelfths in length, passing obliquely backwards and upwards from the aperture of the posterior nares, and opening externally by curving forwards; its greatest diameter 5 twelfths, in its lower third 3 twelfths, and so continuing until it expands into the inferior slit like aperture, which is 8 twelfths long. The cavity of the nose is thus small, and the olfactory nerve, which passes out from the anterior part of the brain, is a slender filament, about ½ of a twelfth in diameter. It runs at first through a bony tube, then passes along the bony septum of the orbits, in contact for a short space with the superior maxillary nerve of the fifth pair, which at its commencement makes a great curve upwards, and crosses the orbit to enter the maxillary cavity, which has no communication with the olfactory. Fig. 2 represents the sternum viewed from before. It is remarkable chiefly for its great breadth and convexity. Its sides, *a*, *b*, *c*, *d*, are nearly parallel; its posterior margin broad, with two shallow notches, *e*, *f*, separated by a short conical obtuse median process. The crest or ridge, *h*, *i*, is carried forward in front, where it is only, however, of moderate height, and is not continued to the posterior extremity, but terminates at *i*, in the most convex part. The coracoid bones, *i*, *i*, are extremely large, very broad at their lower part, and having a deep groove and thin elongated process, *j*, at the upper for the tendon of the pectoralis medius,

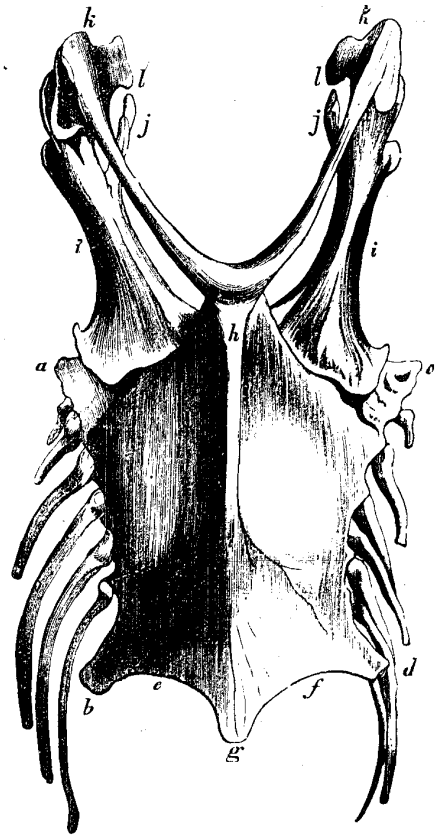


Fig. 2.

W.H

Brown Pelican

Adult Male

which raises the wing. The furcula, *k*, *k*, *l*, is anchylosed with the crest of the sternum, at *h*, has its crura moderately stout and much diverging, and its upper extremity very broad and recurvate. The scapula, of which only the anterior process, *l*, *l*, is seen, is small. A sternal apparatus like this indicates a steady and powerful flight, the wings being supported upon a very firm basis, and well separated. The great mass of the pectoral muscle being thrown forward, it acts more directly than in such birds as the Gallinæ and Ducks, in which it is placed farther backwards, and although its bulk is not so great as in them, it is more advantageously situated. The sternal apparatus of this Pelican is thus extremely similar to that of the Cormorant, and the American Anhinga, and is also constructed on the same plan as that of the Gannets, although in the latter its body is more elongated.

THE BROWN PELICAN.

PELECANUS FUSCUS, *Linn.*

PLATE CCCCXXIII.—MALE. PLATE CCCCXXIV.—YOUNG.

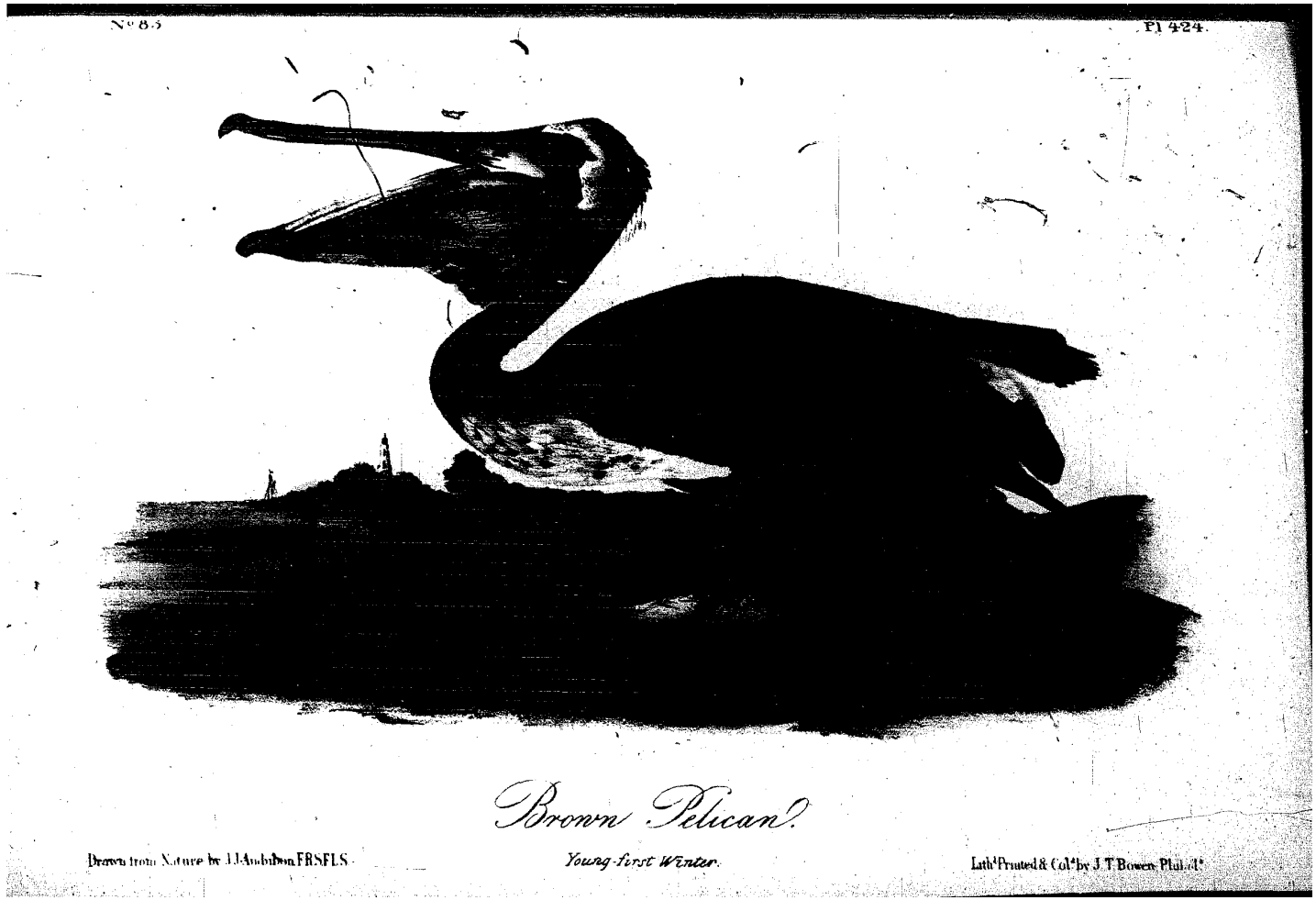
The Brown Pelican, which is one of the most interesting of our American birds, is a constant resident in the Floridas, where it resorts to the Keys and the salt-water inlets, but never enters fresh-water streams, as the White Pelican is wont to do. It is rarely seen farther eastward than Cape Hatteras, but is found to the south far beyond the limits of the United States. Within the recollection of persons still living, its numbers have been considerably reduced, so much indeed that in the inner Bay of Charleston, where twenty or thirty years ago it was quite abundant, very few individuals are now seen, and these chiefly during a continuance of tempestuous weather. There is a naked bar, a few miles distant from the main land, between Charleston and the mouth of the Santee, on which my friend JOHN BACHMAN some years ago saw a great number of these birds, of which he procured several; but at the present day, few are known to breed farther east than the salt-water inlets running parallel to the coast of Florida, forty or fifty miles south of St. Augustine, where I for the first time met with this Pelican in considerable numbers.

My friend JOHN BULOW, Esq., took me in his barge to visit the Halifax, which is a large inlet, and on which we soon reached an island where the Brown Pelicans had bred for a number of years, but where, to my great disappointment, none were then to be seen. The next morning, being ten or twelve miles farther down the stream, we entered another inlet, where I saw several dozens of these birds perched on the mangroves, and apparently sound asleep. I shot at them from a very short distance, and with my first barrel brought two to the water, but although many of them still remained looking at us, I could not send the contents of my second barrel to them, as the shot had unluckily been introduced into it before the powder. They all flew off one after another, and still worse, as the servants approached those which had fallen upon the water, they also flew away.

On arriving at the Keys of Florida, on board the Marion Revenue Cutter, I found the Pelicans pretty numerous. They became more abundant the farther south we proceeded, and I procured specimens at different places, but nowhere so many as at Key West. There you would see them flying within pistol-shot of the wharfs, the boys frequently trying to knock them down with stones, although I believe they rarely succeed in their efforts. The Marion lay at anchor several days at a short distance from this island, and close to another. Scarcely an hour of daylight passed without our having Pelicans around us, all engaged at their ordinary occupations, some fishing, some slumbering as it were on the bosom of the ocean, or on the branches of the mangroves. This place and all around for about forty miles, seemed to be favourite resorts of these birds; and as I had excellent opportunities of observing their habits, I consider myself qualified to present you with some account of them.

The flight of the Brown Pelican, though to appearance heavy, is remarkably well sustained, that bird being able not only to remain many hours at a time on wing, but also to mount to a great height in the air to perform its beautiful evolutions. Their ordinary manner of proceeding, either when single or in flocks, is by easy flappings and sailings alternating at distances of from twenty to thirty yards, when they glide along with great speed. They move in an undulated line, passing at one time high, at another low, over the water or land, for they do not deviate from their course on coming upon a key or a point of land. When the waves run high, you may see them "troughing," as the sailors say, or directing their course along the hollows. While on wing they draw in their head between their shoulders, stretch out their broad webbed feet to their whole extent, and proceed in perfect silence.

When the weather is calm, and a flood of light and heat is poured down upon nature by the genial sun, they are often, especially during the love


No 85
Pl 424.
Brown Pelican?
Young-first Winter.
Drawn from Nature by J.J.Audubon FRSFLS.
Lith.d Printed & Col.d by J.T.Bowen Phil.a

season, seen rising in broad circles, flock after flock, until they attain a height of perhaps a mile, when they gracefully glide on constantly expanded wings, and course round each other, for an hour or more at a time, after which, in curious zigzags, and with remarkable velocity, they descend towards their beloved element, and settle on the water, on large sand-bars or on mangroves. It is interesting beyond description to observe flocks of Brown Pelicans thus going through their aërial evolutions.

Now, reader, look at these birds standing on their strong legs, on that burning sand-bar. How dexterously do they wield that great bill of theirs, as they trim their plumage! Now along each broad quill it passes, drawing it out and displaying its elasticity; and now with necks stretched to their full length, and heads elevated, they direct its point in search of the insects that are concealed along their necks and breasts. Now they drop their wings for awhile, or stretch them alternately to their full extent; some slowly lie down on the sand, others remain standing, quietly draw their head over their broad shoulders, raise one of their feet, and placing their bill on their back, compose themselves to rest. There let them repose in peace. Had they alighted on the waters, you might have seen them, like a fleet at anchor, riding on the ever-rolling billows as unconcernedly as if on shore. Had they perched on yon mangroves, they would have laid themselves flat on the branches, or spread their wings to the sun or the breeze, as Vultures are wont to do.

But see, the tide is advancing; the billows chase each other towards the shores; the mullets joyful and keen leap along the surface, as they fill the bays with their multitudes. The slumbers of the Pelicans are over; the drowsy birds shake their heads, stretch open their mandibles and pouch by way of yawning, expand their ample wings, and simultaneously soar away. Look at them as they fly over the bay; listen to the sound of the splash they make as they drive their open bills, like a pock-net, into the sea, to scoop up their prey; mark how they follow that shoal of porpoises, and snatch up the frightened fishes that strive to escape from them. Down they go, again and again. What voracious creatures they are!

The Brown Pelicans are as well aware of the time of each return of the tide, as the most watchful pilots. Though but a short time before they have been sound asleep, yet without bell or other warning, they suddenly open their eyelids, and all leave their roosts, the instant when the waters, which have themselves reposed for awhile, resume their motion. The Pelicans possess a knowledge beyond this, and in a degree much surpassing that of man with reference to the same subject: they can judge with certainty of the changes of weather. Should you see them fishing all together, in retired bays, be assured, that a storm will burst forth that day; but if they pursue

their finny prey far out at sea, the weather will be fine, and you also may launch your bark and go to the fishing. Indeed, most sea-birds possess the same kind of knowledge, as I have assured myself by repeated observation, in a degree corresponding to their necessities; and the best of all prognosticators of the weather, are the Wild Goose, the Gannet, the Lestris, and the Pelican.

This species procures its food on wing, and in a manner quite different from that of the White Pelican. A flock will leave their resting place, proceed over the waters in search of fish, and when a shoal is perceived, separate at once, when each, from an elevation of from fifteen to twenty-five feet, plunges in an oblique and somewhat winding direction, spreading to the full stretch its lower mandible and pouch, as it reaches the water, and suddenly scoops up the object of its pursuit, immersing the head and neck, and sometimes the body, for an instant. It immediately swallows its prey, rises on wing, dashes on another fish, seizes and devours it, and thus continues, sometimes plunging eight or ten times in a few minutes, and always with unerring aim. When gorged, it rests on the water for awhile, but if it has a brood, or a mate sitting on her eggs, it flies off at once towards them, no matter how heavily laden it may be. The generally received idea that Pelicans keep fish or water in their pouch, to convey them to their young, is quite erroneous. The water which enters the pouch when it is immersed, is immediately forced out between the partially closed mandibles, and the fish, unless larger than those on which they usually feed, is instantly swallowed, to be afterwards disgorged for the benefit of the young, either partially macerated, or whole, according to the age and size of the latter. Of all this I have satisfied myself, when within less than twenty yards of the birds as they were fishing; and I never saw them fly without the pouch being closely contracted towards the lower mandible. Indeed, although I now much regret that I did not make the experiment when I had the means of doing so, I doubt very much if a Pelican could fly at all with its burden so much out of trim, as a sailor would say.

They at times follow the porpoise, when that animal is in pursuit of prey, and as the fishes rise from the deep water towards the surface, come in cunningly for their share, falling upon the frightened shoal, and seizing one or more, which they instantly gobble up. But one of the most curious traits of the Pelican is, that it acts unwittingly as a sort of purveyor to the Gulls just as the Porpoise acts towards itself. The Black-headed Gull of WILSON, which is abundant along the coast of the Floridas in spring and summer, watches the motions of the Pelicans. The latter having plunged after a shoal of small fishes, of which it has caught a number at a time, in letting off the water from amongst them, sometimes allows a few to escape; but the

Gull at that instant alights on the bill of the Pelican, or on its head, and seizes the fry at the moment they were perhaps congratulating themselves on their escape. This every body on board the Marion observed as well as myself, while that vessel was at anchor in the beautiful harbour of Key West. To me such sights were always highly interesting, and I doubt if in the course of my endeavours to amuse you, I ever felt greater pleasure than I do at this moment, when, with my journal at my side, and the Gulls and Pelicans in my mind's eye as distinctly as I could wish, I ponder on the faculties which Nature has bestowed on animals which we merely consider as possessed of instinct. How little do we yet know of the operations of the Divine Power! On the occasions just mentioned, the Pelicans did not manifest the least anger towards the Gulls.

On the ground this species is by no means so active, for it walks heavily, and when running, which it now and then does while in play, or during courtship, it looks extremely awkward, as it then stretches out its neck, partially extends its wings, and reels so that one might imagine it ready to fall at each step. If approached when wounded and on the water, it swims off with speed, and when overtaken, it suddenly turns about, opens its large bill, snaps it violently several times in succession, causing it to emit a smart noise in the manner of owls, strikes at you, and bites very severely. While I was at Mr. BULOW's, his Negro hunter waded after one whose wing had been broken. The Pelican could not be seized without danger, and I was surprised to see the hunter draw his butcher's knife, strike the long blade through the open pouch of the bird, hook it, as it were, by the lower mandible, and at one jerk swing it up into the air with extreme dexterity, after which he broke its neck and dragged it ashore.

The pouch measures from six to ten inches in depth, according to the age of the bird after the first moult. The superb male whose portrait is before you, and which was selected from among a great number, had it about the last mentioned size, and capable of holding a gallon of water, were the mandibles kept horizontal. This membrane is dried and used for keeping snuff, gunpowder and shot. When fresh it may be extended so as to become quite thin and transparent, like a bladder.

This Pelican seldom seizes fish that are longer than its bill, and the size of those on which it ordinarily feeds is much smaller. Indeed, several which I examined, had in the stomach upwards of a hundred fishes, which were only from two to three inches in length. That organ is long, slender, and rather fleshy. In some I found a great number of live blue-coloured worms, measuring two and a half inches in length, and about the thickness of a Crow-quill. The gut is about the size of a Swan's quill, and from ten to twelve feet in length, according to the age of the individual.

At all periods the Brown Pelican keeps in flocks, seldom amounting to more than fifty or sixty individuals of both sexes, and of different ages. At the approach of the pairing time, or about the middle of April, the old males and females separate from the rest, and remove to the inner keys or to large estuaries, well furnished with mangroves of goodly size. The young birds, which are more numerous, remain along the shores of the open sea, unless during heavy gales.

Now let us watch the full grown birds. Some skirmishes have taken place, and the stronger males, by dint of loud snappings of their bill, some hard tugs of the neck and head, and some heavy beats with their wings, have driven away the weaker, which content themselves with less prized belles. The females, although quiet and gentle on ordinary occasions, are more courageous than the males, who, however, are assiduous in their attentions, assist in forming the nest, feed their mates while sitting, and even share the labour of incubation with them. Now see the mated birds, like the citizens of a newly laid out town in some part of our western country, breaking the dry sticks from the trees, and conveying them in their bills to yon mangrove isle. You see they place all their mansions on the south-west side, as if to enjoy the benefit of all the heat of that sultry climate. Myriads of mosquitoes buzz around them, and alight on the naked parts of their body, but this seems to give them no concern. Stick after stick is laid, one crossing another, until a strong platform is constructed. Now roots and withered plants are brought, with which a basin is formed for the eggs. Not a nest, you observe, is placed very low; the birds prefer the tops of the mangroves, although they do not care how many nests are on one tree, or how near the trees are to each other. The eggs, of which there are never more three, are rather elliptical, and average three inches and one-eighth in length, by two inches and one-eighth in their greatest breadth. The shell is thick and rather rough, of a pure white colour, with a few faint streaks of a rosy tint, and blotches of a very pale hue, from the centre towards the crown of the egg.

The young are at first covered with cream-coloured down, and have the bill and feet disproportionately large. They are fed with great care, and so abundantly, that the refuse of their food, putrid and disgusting, lies in great quantities round them; but neither young nor old regard this, however offensive it may be to you. As the former grow the latter bring larger fish to them. At first the food is dropped in a well macerated state into their extended throats; afterwards the fish is given to them entire; and finally the parent birds merely place it on the edge of the nest. The young increase in size at a surprising rate. When half fledged they seem a mere mass of fat, their partially indurated bill has acquired considerable length, their

wings droop by their sides, and they would be utterly unable to walk. The Vultures at this period often fall upon them and devour them in the absence of their parents. The Indians also carry them off in considerable numbers; and farther eastward, on the Halifax river, for instance, the Negroes kill all they can find, to make gumbo soup of them during winter. The Crows, less powerful, but quite as cunning, suck the eggs; and many a young one which has accidentally fallen from the nest, is sure to be picked up by some quadruped, or devoured by the Shark or Balacuda. When extensive depredations have thus been made, the birds abandon their breeding places, and do not return to them. The Pelicans in fact are, year after year, retiring from the vicinity of man, and although they afford but very unsavoury food at any period of their lives, will yet be hunted beyond the range of civilization, just as our best of all game, the Wild Turkey, is now, until to meet with them the student of nature will have to sail round Terra del Fuego, while he may be obliged to travel to the Rocky Mountains before he can find the other bird. Should you approach a settlement of the Pelicans and fire a few shots at them, they all abandon the place, and leave their eggs or young entirely at your disposal.

At all seasons, the Negroes of the plantations on the eastern coast of the Floridas lie in wait for the Pelicans. There, observe that fellow, who, with rusty musket, containing a tremendous charge of heavy shot, is concealed among the palmettos, on the brink of a kind of embankment formed by the shelly sand. Now comes a flock of Pelicans, forcing their way against the breeze, unaware of the danger into which they rush, for there, a few yards apart, several Negroes crouch in readiness to fire; and let me tell you, good shots they are. Now a blast forces the birds along the shore; off goes the first gun, and down comes a Pelican; shot succeeds shot; and now the Negroes run up to gather the spoil. They skin the birds like so many racoons, cut off the head, wings, and feet; and should you come this way next year, you may find these remains bleached in the sun. Towards night, the sable hunters carry off their booty, marching along in Indian file, and filling the air with their extemporaneous songs. At home they perhaps salt, or perhaps smoke them; but in whatever way the Pelicans are prepared, they are esteemed good food by the sons of Africa.

The Brown Pelican is a strong and tough bird, although not so weighty as the white species. Its flesh is, in my opinion, always impure. It seems never satisfied with food, and it mutes so profusely, that not a spot of verdure can be seen on the originally glossy and deep-colored mangroves on which it nestles; and I must say that, much as I admire it in some respects, I should be sorry to keep it near me as a pet.

During winter, when the mullet, a favourite fish with the Brown Pelican,

as it is with me, retires into deeper water, these birds advance farther to seaward, and may be seen over all parts of the Gulf of Mexico, and between the Florida Reefs and the opposite isles, especially during fine weather. They are very sensible to cold, and in this respect are tender birds. Now and then, at the season, they are seen on Lake Borgne and over Lake Pontchartrain, but never on the Mississippi beyond the rise of the tides, the space higher up being abandoned to the White Pelican. The keenness of their sight is probably equal to that of any Hawk, and their hearing is also very acute. They are extremely silent birds, but when excited they utter a loud and rough grunt, which is far from musical. Several persons in the Floridas assured me that the Brown Pelicans breed at all seasons of the year ; but as I observed nothing to countenance such an idea, I would give it as my opinion that they raise only one brood in the season.

Their bodies are greatly inflated by large air-cells ; their bones, though strong, are very light ; and they are tough to kill.

Since I wrote my account of the habits of this very interesting bird, I have followed it westward as far as the inland bays of the Texas, where I found it almost as abundant as on the coast of the Floridas. In the former country, however, I observed it breeding on the ground, and on the small naked islets of the large bays margining the Mexican Gulf. The nests were formed much in the same manner as when placed on trees, and the eggs were of the same number as stated. Having examined several specimens procured on the nest, in the act of incubation, I found that the plumage of the fully adult female is precisely like that of the male ; and I am now convinced that birds of both sexes are several years in acquiring their full plumage, although the precise number of years is what I have not yet learned. Some additional observations respecting the habits of this species may now be stated.

During a severe gale, on the 7th of April, 1836, the wind coming from the north-west, I saw a flock of about thirty of these birds flying only a few feet above the water, and against the gale. Having proceeded a few yards, they plunged into the water, generally to leeward, and threw their bodies round as soon as their bills were immersed, giving a very curious appearance to the wings, which seemed as if locked. On seizing a fish they kept the bill beneath the surface for a short time in a perpendicular direction, and drew it up gradually, when the water was seen to flow out, after which they raised the bill to an horizontal position, and swallowed the fish. In this way the whole flock kept dashing and plunging pell-mell, like Gannets, over a space of about one hundred yards, fishing at times in the very surf, and where the water could not be more than a very few feet deep. Each of them must have caught upwards of a score of fishes. As soon as they were

satisfied, they flew in a line across the channel, and landed on low banks under the lee of the island, opposite our harbour. During all the time of their fishing they were attended by a number of Black-headed Gulls, *Larus Atricilla*, which followed all their movements, alighting on their heads, and feeding as I have already described. These Gulls followed their purveyors to some low banks to spend the night.

Notwithstanding all that has been said to the contrary by some European writers, I feel perfectly satisfied that these Pelicans must make ample use of some oily matter contained in the uropygial gland, as their plumage is always dry in the midst of their continued plungings. On the 14th of the same month, my party happened to shoot a good number of Brown Pelicans, among which was one slightly wounded in the body. The sailors tied its bill with a piece of rope-yarn, and placed it in the stern of the boat; but while they were again charging their muskets, the bird recovered sufficiently to take to its wings, clear the boat, and fly off. In such a condition it must necessarily have perished of hunger.

PELECANUS FUSCUS, Bonap. Syn., p. 401.

BROWN PELICAN, Nutt. Man., vol. ii. p. 476.

BROWN PELICAN, *Pelecanus fuscus*, Aud. Orn. Biog., vol. iii. p. 376; vol. v. p. 212.

Adult, 52, 80.

Very abundant and constantly resident from Texas along the shores eastward to North Carolina. Breeds on trees and also on the ground; eggs three.

Adult Male.

Bill more than twice the length of the head, rather stout, straight, depressed towards the end. Upper mandible with the dorsal line straight as far as the unguis, the ridge broad and convex, separated from the side by a groove on each side, broader and more convex at the base, narrowed and flattened towards the unguis, which is curved, stout, convex above, sharp-edged, acute; sides of the bill perpendicular at the base, narrowed towards the middle, widened and approaching to horizontal towards the end; edges sharp, with a broad furrowed groove beneath for the reception of those of the lower mandible. Lower mandible with the angle extending to less than half an inch from the tip, and filled by a bare membrane, the sides nearly erect and convex, the edges sharp, the tip compressed, deflected, obtuse. The membrane of the lower mandible extends down the fore neck in the form of a wrinkled pouch.

Head of moderate size, oblong; neck long, stout; body rather slender. Feet short, stout, nearly central; tibia bare, its lower part covered all round with small scales; tarsus short, stout, compressed, covered all round with

hexagonal scales, of which the anterior are much larger; toes in the same plane, all connected by reticulated webs, the first shortest, the third and fourth nearly equal, reticulate at the base, scutellate along the rest of the upper surface, claws short, strong, curved, rather acute, that of hind toe with a sharp pectinate inner edge.

Feathers of the head and neck exceedingly small and slender, of the fore part of the head stiff, hair-like and glossy; of the upper middle part of the neck behind a little larger and soft, forming a slight longitudinal crest; of the sides and hind part of the neck soft and downy. The feathers of the upper parts in general are remarkably small, narrow, tapering to a point; of the lower part of the neck stiff and pointed, of the breast and sides somewhat larger than those above, and softer. Wings long, rounded; primaries much curved, with strong square shafts; the second longest, the third very little shorter, the first a little longer than the fifth, secondaries very numerous, rather small, rounded, the inner longer and more tapering. Tail short, slightly rounded, of twenty-two feathers.

Bill greyish-white, tinged with brown, and marked with irregular spots of pale carmine; upper mandible dusky towards the end, lower blackish from the middle to near the end. Bare space between the bill and the eye deep blue; eyelids pink; iris white. Feet black. The gular pouch is greenish-black, the ridges of its wrinkles lighter. The hair-like feathers on the fore part of the head light yellow, the rest of the head white; a stripe of the same margining the pouch to the middle of the neck, and extending a little beyond, a short space between these two lines anteriorly, and the whole of the posterior and lateral parts of the neck of a dark chestnut-brown, the small crest paler. The back and wings are dusky, each feather with the central part greyish-white; the latter colour prevails on the scapulars and larger wing-coverts. Primaries and their coverts brownish-black, secondaries greyish-brown, their outer edges greyish-white; tail light grey; the shafts of the quills and tail-feathers are white in their basal half, black towards the end. The lower parts are brownish-grey; the sides of the neck and body with narrow longitudinal white lines. On the fore neck, below the dark chestnut spot is a smaller pale yellow mark, behind which the feathers for a short space are blackish-brown.

Length to end of tail 52 inches, to end of wings 52, to end of claws 53¼; extent of wings 80; bill along the ridge 13¼, along the edge of lower mandible 14¼; depth of gular pouch 10, its extent along the neck 13; wing from flexure 24; tail 7; tarsus 2¼; middle toe 3 1/12, its claw 9/12. Weight 6 lbs. 4½ oz.

The Female, which is considerably larger, resembles the male in colour, only that the neck is yellowish-white in its whole extent, without any

brown, and its feathers are stiff and not downy as in the male. Weight 7 lbs. 12 oz.

Young.

Bill greyish-blue, its edges and unguis greyish-yellow; gular pouch dull greyish-blue. Iris brownish-yellow; bare space around the eye of a dusky bluish tint, the feathers margining it yellowish-white. The feathers of the head and neck are less downy than in the adult, and those on the sides of the latter less elongated or pointed. The head and neck are dark brown, as are the upper parts generally; the secondary and many of the smaller coverts margined with pale brown; the primaries and their coverts as well as the tail-coverts brownish-black, with white shafts. Feet and claws dull leaden colour.

In an adult female preserved in spirits the general peculiarities of the organization are the same as those described in the American White Pelican.

The Mangrove.

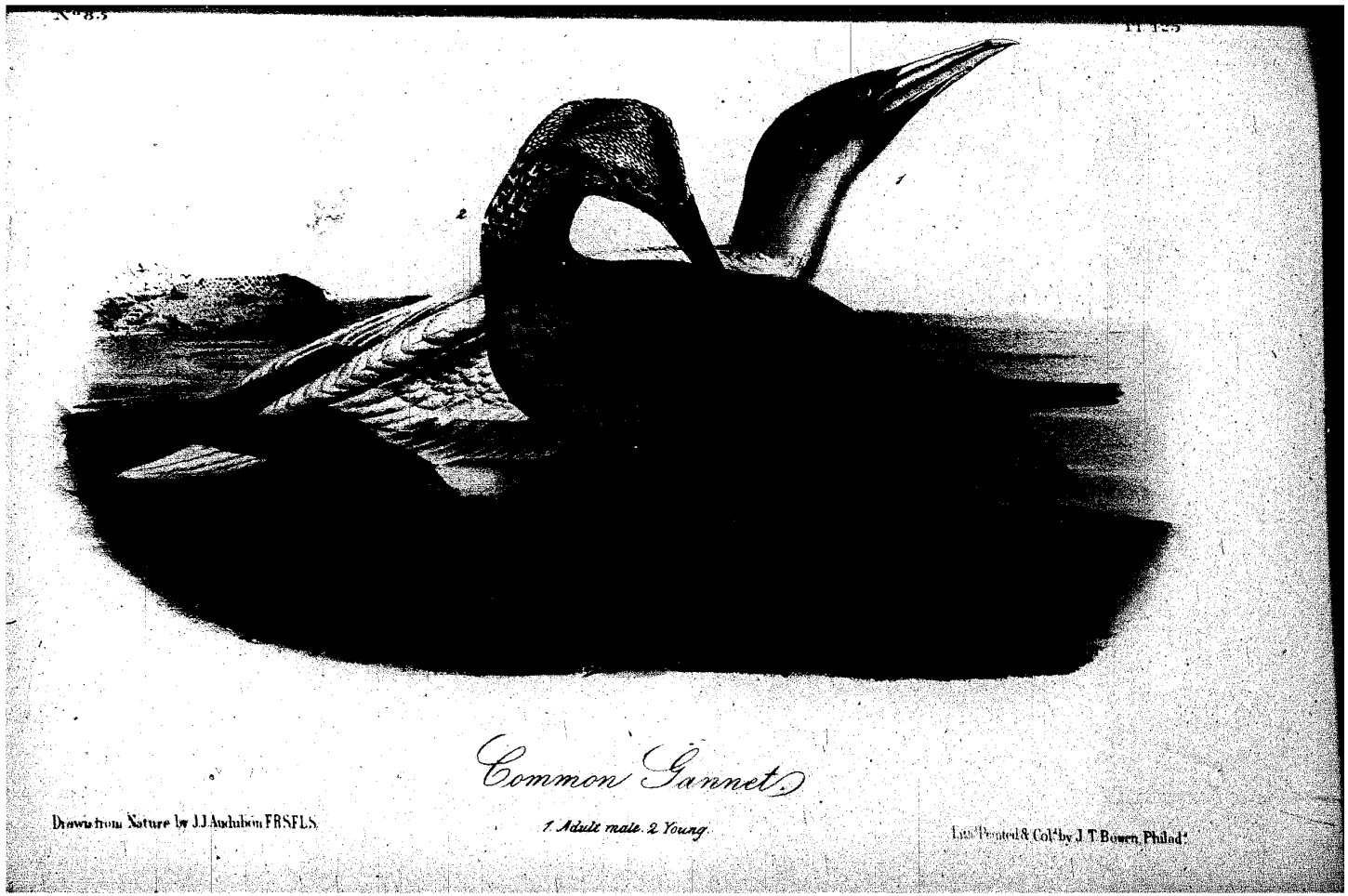
Rhizophora Mangle, *Linn.*, Syst. Nat., vol. ii. p. 325.

The species of *mangrove* represented in the plate is very abundant along the coast of Florida and on almost all the Keys, excepting the Tortugas. Those islands which are named Wet Keys are entirely formed of mangroves, which, raising their crooked and slender stems from a bed of mud, continue to increase until their roots and pendent branches afford shelter to the accumulating debris, when the earth is gradually raised above the surface of the water. No sooner has this taken place than the mangroves in the central part of the island begin to decay, and in the course of time there is only an outer fringe or fence of trees, while the interior becomes overgrown with grass and low bushes. Meantime the mangroves extend towards the sea, their hanging branches taking root wherever they come in contact with the bottom, and their seeds also springing up. I am at a loss for an object with which to compare these trees, in order to afford you an idea of them; yet if you will figure to yourself a tree reversed, and standing on its summit, you may obtain a tolerable notion of their figure and mode of growth. The stem, roots and branches are very tough and stubborn, and in some places the trees are so intertwined that a person might find it as easy to crawl over them as to make his way between them. They are evergreen, and their tops afford a place of resort to various species of birds at all seasons, while their roots and submersed branches give shelter to numberless testaceous mollusca and small fishes. The species represented is rarely observed on the coast of

Florida of a greater height than twenty-five or thirty feet, and its average height is not above fifteen feet. The *land mangrove*, of which I have seen only a few, the finest of which were on Key West, is a tall tree, much larger and better shaped than the other, with narrower leaves and shorter fruits.

Genus V.—SULA, *Briss.* GANNET.

Bill longer than the head, opening beyond the eyes, straight, elongated, conical, moderately compressed; upper mandible with the dorsal line straight and declinate, at the end convex and a little decurved; the ridge very broad, convex, with a slight median carina, and separated on each side from the sides, which are perpendicular, slightly convex, and have an additional narrow-jointed piece below the eye; edges sharp, direct, irregularly serrate, with numerous slender cuts directed backwards, tip compressed, a little decurved, rather acute; lower mandible with the angle extremely long and narrow, the dorsal line straight, ascending, the sides erect, convex, the edges sharp and serrated, the tip compressed, acute. No external nostrils. Head large, neck of moderate length, and very thick; body of moderate bulk, rather elongated. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, scaly, with three lines of small transversely oblong scutella, which run down the toes, the latter long and slender, all united by membranes having their margins straight; first toe rather small, directed inwards and forwards; middle toe longest, the outer almost equal. Claws of moderate size, slightly arched, that of the third toe pectinate. Plumage generally close, rather compact, on the head and neck blended. Wings very long, narrow, acute; first quill longest. Tail rather long, cuneate, of twelve or fourteen feathers. Gular sac small, with a small median portion bare; tongue extremely small, blunt; œsophagus extremely wide; proventricular glands forming a broad belt partially divided by intervals; stomach extremely small, its muscular coat thin, the inner soft; intestine of moderate length, slender cœca very small; cloaca globular.


Common Gannet.
Drawn from Nature by J.J. Audubon F.R.S.F.L.S.
1. Adult male. 2. Young.
Lith. Printed & Col.d by J.T. Bowen, Philad.a

COMMON GANNET.

SULA BASSANA, *Linn.*

PLATE CCCCXXV.—ADULT MALE AND YOUNG.

On the morning of the 14th of June, 1833, the white sails of the Ripley were spread before a propitious breeze, and onward she might be seen gaily wending her way toward the shores of Labrador. We had well explored the Magdalene Islands, and were anxious to visit the Great Gannet Rock, where, according to our pilot, the birds from which it derives its name breed. For several days I had observed numerous files proceeding northward, and marked their mode of flight while thus travelling. As our bark dashed through the heaving billows, my anxiety to reach the desired spot increased. At length, about ten o'clock, we discerned at a distance a white speck, which our pilot assured us was the celebrated rock of our wishes. After awhile I could distinctly see its top from the deck, and thought that it was still covered with snow several feet deep. As we approached it, I imagined that the atmosphere around was filled with flakes, but on my turning to the pilot, who smiled at my simplicity, I was assured that nothing was in sight but the Gannets and their island home. I rubbed my eyes, took up my glass, and saw that the strange dimness of the air before us was caused by the innumerable birds, whose white bodies and black-tipped pinions produced a blended tint of light grey. When we had advanced to within half a mile, this magnificent veil of floating Gannets was easily seen, now shooting upwards, as if intent on reaching the sky, then descending as if to join the feathered masses below, and again diverging toward either side and sweeping over the surface of the ocean. The Ripley now partially furled her sails, and lay to, when all on board were eager to scale the abrupt sides of the mountain isle, and satify their curiosity.

Judge, reader, of our disappointment. The weather, which hitherto had been beautiful, suddenly changed, and we were assailed by a fearful storm. However, the whale-boat was hoisted over, and manned by four sturdy "down-easters," along with THOMAS LINCOLN and my son. I remained on board the Ripley, and commenced my distant observations, which I shall relate in due time.

An hour has elapsed; the boat, which had been hid from our sight, is now

in view; the waves run high, and all around looks dismal. See what exertions the rowers make; it blows a hurricane, and each successive billow seems destined to overwhelm their fragile bark. My anxiety is intense, as you may imagine; in the midst of my friends and the crew I watch every movement of the boat, now balanced on the very crest of a rolling and foaming wave, now sunk far into the deep trough. We see how eagerly yet calmly they pull. My son stands erect, steering with a long oar, and LINCOLN is bailing the water which is gaining on him, for the spray ever and anon dashes over the bow. But they draw near, a rope is thrown and caught, the whale-boat is hauled close under our lee-board; in a moment more all are safe on deck, the helm round, the schooner to, and away under bare poles she scuds toward Labrador.

THOMAS LINCOLN and my son were much exhausted, and the sailors required a double allowance of grog. A quantity of eggs of various kinds, and several birds, had been procured, for wherever sufficient room for a Gannet's nest was not afforded on the rock, one or two Guillemots occupied the spot, and on the ledges below, the Kittiwakes lay thick like snow-flakes. The discharging of their guns produced no other effect than to cause the birds killed or severely wounded to fall into the water, for the cries of the countless multitudes drowned every other noise. The party had their clothes smeared with the nauseous excrements of hundreds of Gannets and other birds, which in shooting off from their nests caused numerous eggs to fall, of which some were procured entire. The confusion on and around the rock was represented as baffling all description; and as we gazed on the mass now gradually fading on our sight, we all judged it well worth the while to cross the ocean to see such a sight. But yet it was in some measure a painful sight to me, for I had not been able to land on this great breeding-place, of which, however, I here present a description given by our pilot Mr. GODWIN.

"The top of the main rock is a quarter of a mile wide, from north to south, but narrower in the other direction. Its elevation is estimated at about four hundred feet. It stands in lat. 47° 52′. The surf beats its base with great violence, unless after a long calm, and it is extremely difficult to land upon it, and still more so to ascend to the top or platform. The only point on which a boat may be landed lies on the south side, and the moment the boat strikes it must be hauled dry on the rocks. The whole surface of the upper platform is closely covered with nests, placed about two feet asunder, and in such regular order that a person may see between the lines, which run north and south, as if looking along the furrows of a deeply ploughed field. The Labrador fishermen and others who annually visit this extraordinary resort of the Gannets, for the purpose of procuring their flesh to bait

their cod-fish hooks, ascend armed with heavy short clubs, in parties of eight, ten, or more, and at once begin their work of destruction. At sight of these unwelcome intruders, the affrighted birds rise on wing with a noise like thunder, and fly off in such a hurried and confused manner as to impede each other's progress, by which thousands are forced downwards, and accumulate into a bank many feet high; the men beating and killing them with their clubs until fatigued, or satisfied with the number they have slain.' Here Mr. GODWIN assured us that he had visited the Gannet Rock ten seasons in succession, for the purpose just mentioned, and added, that on one of these occasions, "six men had destroyed five hundred and forty Gannets in about an hour, after which the party rested awhile, and until most of the living birds had left their immediate neighbourhood, for all around them, beyond the distance of about a hundred yards, thousands of Gannets were yet sitting on their nests, and the air was filled with multitudes of others. The dead birds are now roughly skinned, and the flesh of the breast cut up in pieces of different sizes, which will keep good for bait about a fortnight or three weeks. So great is the destruction of these birds for the purpose mentioned, that the quantity of their flesh so procured supplies with bait upwards of forty boats, which lie fishing close to the Island of Brion each season. By the 20th of May the rock is covered with birds on their nests and eggs, and about a month afterwards the young are hatched. The earth is scratched by the birds for a few inches deep, and the edges surrounded by sea-weeds and other rubbish, to the height of eight or ten inches, tolerably well matted together. Each female Gannet lays a single egg, which is pure white, but not larger than a good-sized hen's egg. When the young are hatched, they are bluish-black, and for a fortnight or more their skin is not unlike that of the common dog-fish. They gradually become downy and white, and when five or six weeks old look like great lumps of carded wool."

I was well pleased with this plain statement of our pilot, as I had with my glass observed the regularity of the lines of nests, and seen many of the birds digging the earth with their strong bills, while hundreds of them were carrying quantities of that long sea-weed called *eel-grass*, which they seem to bring from towards the Magdalene Islands. While the Ripley lay to near the rock, thousands of the Gannets constantly flew over our heads; and although I shot at and brought several to the water, neither the reports nor the sight of their dead companions seemed to make any impression on them.

On weighing several of the Gannets brought on board, I found them to average rather more than seven pounds; but Mr. GODWIN assured me that when the young birds are almost ready to fly, they weigh eight and sometimes nine pounds. This I afterwards ascertained to be true, and I account for the difference exhibited at this period by the young birds, by the great

profusion of food with which their parents supply them, regardless in a great measure of their own wants. The pilot further told me that the stench on the summit of the rock was insupportable, covered as it is during the breeding season, and after the first visits of the fishermen, with the remains of carcasses of old and young birds, broken and rotten eggs, excrements, and multitudes of fishes. He added that the Gannets, although cowardly birds, at times stand and await the approach of a man, with open bill, and strike furious and dangerous blows. Let me now, reader, assure you that unless you had seen the sight witnessed by my party and myself that day, you could not form a correct idea of the impression it has to this moment left on my mind.

The extent of the southward migration of the Gannet, after it has reared its young, is far greater perhaps than has hitherto been supposed. I have frequently seen it on the Gulf of Mexico, in the latter part of autumn and in winter; and a few were met with, in the course of my last expedition, as far as the entrance of the Sabine river into the Gulf. Being entirely a maritime species, it never proceeds inland, unless forced by violent gales, which have produced a few such instances in Nova Scotia and the State of Maine, as well as the Floridas, where I saw one that had been found dead in the woods two days after a furious hurricane. The greater number of the birds of this species seen in these warm latitudes during winter are young of that or the preceding year. My friend JOHN BACHMAN has informed me that during one of his visits to the Sea Islands off the shores of South Carolina, on the 2nd of July, 1836, he observed a flock of Gannets of from fifty to a hundred, all of the colouring of the one in my plate, and which was a bird in its first winter plumage. They were seen during several days on and about Cole's Island, at times on the sands, at others among the rolling breakers. He also mentions having heard Mr. GILES, an acquaintance of his, who knows much about birds, say, that in the course of the preceding summer he had seen a pair of Gannets going to, and returning from, a nest in a tree! This is in accordance with the report of Captain NAPOLEON COSTE, who commanded the United States revenue cutter Campbell, placed at my disposal during my visit to Texas, and who was lieutenant as well as pilot of the Marion. He stated that he had found a breeding place on the coast of Georgia, occupied by a flock of old, and therefore White Gannets, the nests of all of which were placed upon trees. No one can be greatly surprised at these reports, who knows, as I do, that the Brown Gannet, *Sula fusca*, breeds both on trees and on dry elevated sand-bars. During winter months I have generally observed single birds at some considerable distance from the shore out at sea, sometimes indeed beyond what mariners call

soundings, but rarely young ones, they generally keeping much nearer to the shores, and procuring their food in shallower water.

The flight of the Gannet is powerful, well sustained, and at times extremely elegant. While travelling, whether in fine or foul weather, they fly low over the surface of the water, flapping their wings thirty or forty times in succession, in the manner of the Ibis and the Brown Pelican, and then sailing about an equal distance, with the wings at right angles to the body, and the neck extended forwards. But, reader, to judge of the elegance of this bird while on wing, I would advise you to gaze on it from the deck of any of our packet ships, when her commander has first communicated the joyful news that you are less than three hundred miles from the nearest shore, whether it be that of merry England or of my own beloved country. You would then see the powerful fisher, on well-spread pinions, and high over the water, glide silently along, surveying each swelling wave below, and coursing with so much ease and buoyancy as to tempt you to think that had you been furnished with equal powers of flight, you might perform a journey of eighty or ninety miles without the slightest fatigue in a single hour. But perhaps at the very moment when these thoughts have crossed your mind, as they many times have crossed mine on such occasions, they are suddenly checked by the action of the bird, which, intent on filling its empty stomach, and heedless of your fancies, plunges headlong through the air, with the speed of a meteor, and instantaneously snatches the fish which its keen sight had discovered from on high. Now perchance you may see the snow-white bird sit buoyantly for awhile on the bosom of its beloved element, either munching its prey, or swallowing it at once. Or perhaps, if disappointed in its attempt, you will see it rise by continued flappings, shaking its tail sideways the while, and snugly covering its broad webbed feet among the under coverts of that useful rudder, after which it proceeds in a straight course, until its wings being well supplied by the flowing air, it gradually ascends to its former height, and commences its search anew.

In severe windy weather, I have seen the Gannet propelling itself against the gale by sweeps of considerable extent, placing its body almost sideways or obliquely, and thus alternately, in the manner of Petrels and Guillemots; and I have thought that the bird then moved with more velocity than at any other time, except when plunging after its prey. Persons who have seen it while engaged in procuring food, must, like myself, have been surprised when they have read in books that Gannets "are never known to dive," and yet are assured that they "have been taken by a fish fastened to a board sunk to the depth of two fathoms, in which case the neck has either been found dislocated, or the bill firmly fixed in the wood." With such statements

before him, one might think that his own vision had been defective, had he not been careful to note down at once the result of his observations. And as this is a matter of habit with me, I will offer you mine, good reader, not caring one jot for what has been said to you before on the subject.

I have seen the Gannet plunge, and afterwards remain under the surface of the water for at least one minute at a time. On one occasion of this kind, I shot one just as it emerged, and which held a fish firmly in its bill, and had two others half-way down its throat. This has induced me to believe that it sometimes follows its prey in the water, and seizes several fishes in succession. At other times I have observed the Gannet plunge amidst a shoal of launces so as scarcely to enter the water, and afterwards follow them, swimming, or as it were running, on the water, with its wings extended upwards, and striking to the right and left until it was satiated. While on the Gulf of Mexico, I wounded a Gannet, which, on falling to the water, swam so fast before the boat, that we rowed about a quarter of a mile before we reached it, when it suddenly turned towards us, opened its bill, as if intent on defending itself, but was killed with the stroke of an oar by one of the sailors. When shot at without even being touched, these birds often disgorge their food in the manner of Vultures; and this they always do when wounded, if their stomach and gullet happen to be full. Sometimes, after being wounded in the wings, they will float and allow you to take them, without making any attempt to escape. Nay, my young friend, GEORGE C. SHATTUCK, M. D., of Boston, while with me at Labrador, caught one which he found walking amongst a great number of Guillemots, on a low and rocky island.

When they are on their favourite breeding rocks, and about to fly, they elevate their head, throw it backward, open the bill, and emit a loud prolonged cry, before launching themselves into the air, in doing which they waddle a few paces with their wings partially extended. After starting, their first motion is greatly inclined downwards, but they presently recover, and seem to support themselves with ease. When they are twenty or thirty yards off, you observe them shaking the tail sideways, and then hiding their feet among the under coverts of the tail. At other times they suddenly open their feet, moving them as if for the purpose of grasping some object below, in the same manner as some Hawks, but only for a few moments, when again the tail is shaken, and the feet hidden as before. They beat their wings and sail alternately, even when flying around their breeding places.

On the ground the movements of the Gannet are exceedingly awkward, and it marches with hampered steps, assisting itself with the wings, or keeping them partially open, to prevent its falling. Their walk, indeed, is

merely a hobble. When the sun shines, they are fond of opening their wings and beating them in the manner of Cormorants, shaking the head meanwhile rather violently, and emitting their usual uncouth guttural notes of *cara, karew, karow.* You may well imagine the effect of a concert performed by all the Gannets congregated for the purpose of breeding on such a rock as that in the Gulf of St. Lawrence, where, amidst the uproar produced by the repetition of these notes, you now and then distinguish the loud and continued wolfish howling-like sounds of those about to fly off.

The newly-finished nest of this bird is fully two feet high, and quite as broad externally. It is composed of seaweeds and maritime grasses, the former being at times brought from considerable distances. Thus, the Gannets breeding on the rocks in the Gulf of St. Lawrence, carry weeds from the Magdalene Islands, which are about thirty miles distant. The grasses are pulled or dug up from the surface of the breeding place itself, often in great clods consisting of roots and earth, and leaving holes not unlike the entrances to the burrows of the Puffin. The nests, like those of Cormorants, are enlarged or repaired annually. The single egg, of a rather elongated oval form, averages three inches and one-twelfth in length, by two inches in its greatest breadth, and is covered with an irregular roughish coating of white calcareous matter, which, on being scraped off, leaves exposed the pale greenish-blue tint of the under layer.

The birds usually reach the rock when already paired, in files often of hundreds, and are soon seen billing in the manner of Cormorants, and copulating on the rocks, but never, like the birds just mentioned, on the water, as some have supposed. The period of their arrival at their breeding grounds appears to depend much on the latitude of the place; for, on the Bass Rock, in the Firth of Forth, which I had the pleasure of visiting in the agreeable company of my learned friend WILLIAM MACGILLIVRAY and his son, on the 19th of August, 1825, the Gannets are first seen in February, whereas in the Gulf of St. Lawrence they rarely reach the Great Rock until the middle of April or beginning of May; and at Chateau Beau in the Straits of Belle Isle, not until a fortnight or three weeks later. Like the members of most large communities, the Gannets, though so truly gregarious at this season, shew a considerable degree of animosity towards their more immediate neighbours as soon as incubation commences. A lazy bird perhaps, finding it easier to rob the nest of its friend of weeds and sods, than to convey them from some distant place, seizes some, on which the other resents the injury, and some well-directed thrusts of their strong bills are made, in open day and in full view of the assembled sitters, who rarely fail to look on with interest, and pass the news from one to another, until all are apprized of the quarrel. The time however passes on. The patient mother, to lend more

warmth to her only egg, plucks a few of the feathers from some distance beneath her breast. In sunny weather, she expands those of her upper parts, and passing her bill along their roots, destroys the vile insects that lurk there. Should a boisterous gale or a thick cold fog mar the beauty of the day, she gathers her apparel around her, and shrinks deeper into her bed; and should it rain, she places her body so as to prevent the inundation of her household. How happy, reader, must she be when now and then her keen eyes distinguish in the crowd her affectionate mate, as he returns from the chase, with loaded bill, and has already marked her among the thousand beauties all equally anxious for the arrival of their lords! Now by her side he alights as gently as is in his nature, presents her with a welcome repast, talks perhaps cheeringly to her, and again opening his broad wings departs in search of a shoal of herrings. At length, the oval chest opens, and out crawls the tender young; but lo! the little thing is black. What a strange contrast to the almost pure white of the parent! Yet the mother loves it, with all the tenderness of other mothers. She has anxiously expected its appearance, and at once she nurses it with care; but so tender is it that she prefers waiting awhile before she feeds it. The time however soon comes, and with exceeding care she provides some well macerated morsels which she drops into its open mouth; so well prepared are they that there is no instance on record of a Gannet, even of that tender age, having suffered from dyspepsia or indigestion.

The male Gannet assists in incubating, though he sits less assiduously than the female; and, on such occasions, the free bird supplies the other with food. The sight of the young Gannet just after birth might not please the eye of many, for it is then quite naked, and of a deep bluish-black, much resembling a young Cormorant. Its abdomen is extremely large, its neck thin, its head large, its eyes as yet sightless, its wings but slightly developed. When we look at it three weeks afterwards, it has grown much, and almost entirely changed its colour, for, now, with the exception of certain parts of the neck, the short thighs, and the belly, it is covered with yellowish soft and thick down. In this state it looks perhaps as uncouth as at first, but it grows so rapidly that at the end of three weeks more, you find its downy coat patched with feathers in the most picturesque manner imaginable. Looking around you, you observe that all the young are not of the same growth; for all the Gannets do not lay on the same day, and probably all the young are not equally supplied with food. At this period, the great eyrie looks as if all its parts had become common property; the nests, which were once well fashioned, are trampled down; the young birds stand everywhere or anywhere; lazy-looking creatures they are, and with an appearance of nonchalance which I have never observed in any other species of bird, and

which would lead you to think that they care as little about the present as the future. Now the old birds are freed of part of their cares, they drop such fish as they have obtained by the side of their young, and, like Cormorants, Pelicans, or Herons, seldom bring a supply oftener than once a-day. Strange to say, the young birds at this period do not appear to pay the least attention to the old ones, which occasionally alight near them, and drop fish for them to feed upon.

Gannets do not feed, as some have supposed, and as many have believed, on herring only; for I have found in their stomachs codlings eight inches in length, as well as very large American mackerels, which, by the way, are quite different from those so abundantly met with on the coasts of Europe.

The young never leave the spot on which they have been reared until they are well able to fly, when they separate from the old birds, and do not rejoin them until at least a year after. Although I have in a few instances found individuals yet patched with dark grey spots, and with most of their primary quills still black, I am confident that it is not until the end of two years that they acquire their full plumage. I have seen some with one wing almost pure black, and the tail of that colour also; others with the tail only black; and several with pure black feathers interspersed among the general white plumage.

I know of no other bird that has so few formidable enemies as the Gannet. Not one of the species of Lestris with which I am acquainted ever attempts to molest it; and, although I have seen the Frigate Pelican in quest of food within a short distance of it, I never saw it offer injury. The insular rocks on which it breeds are of course inaccessible to quadrupeds. The only animals, so far as I know, that feed on the eggs or young, are the *Larus morinus* and *Larus glaucus*. It is said that the Skua, *Lestris Catarractes*, sometimes pursues the Gannets, but that species does not exist in North America; and I am inclined to doubt the truth of this statement, for I have never seen a Lestris of any kind attack a bird equal to itself in size and strength.

Soon after the young Gannets are able to fly, all the birds of the species leave the breeding place, and absent themselves until the following season. While at Newfoundland, I was told that the English and French fishermen who inhabit that country salt young Gannets for winter provision, as is done in Scotland; but I saw none there. In my estimation, the flesh of this bird is so bad that, as long as any other can be procured, it ought to be rejected.

It is a curious fact, that the Gannets often procure mackerels or herrings four or five weeks before the fishermen fall in with them on our coast; but this is easily explained by their extensive wanderings. Although this bird is easily kept in captivity, it is far from being a pleasant pet. Its ordure is

abundant, disagreeable to the eye as well as the nose; its gait is awkward; and even its pale owl-like eyes glare on you with an unpleasant expression. Add to this, the expense of its food, and I can easily conceive that you will not give it a place in your aviary, unless for the mere amusement of seeing it catch the food thrown to it, which it does like a dog.

The feathers of the lower parts of the Gannet differ from those of most other birds, in being extremely convex externally, which gives the bird the appearance of being covered beneath with light shell-work, exceedingly difficult to be represented in a drawing.

Sula bassana, Bonap. Syn., p. 408.
Gannet, *Sula bassana*, Nutt. Man., vol. ii. p. 495.
Common Gannet, *Sula bassana*, Aud. Orn. Biog., vol. iv. p. 222.

Adult, 40½, 75. Young fledged, 38, 72.

Ranges southward off the coast at all seasons as far as the Gulf of Mexico. Breeds on rocks on the Gulf of St. Lawrence, and off the coast of Labrador. Abundant. Migratory.

Adult Male.

Bill longer than the head, opening beyond the eyes, straight, elongated-conical, moderately compressed. Upper mandible with the dorsal line straight and declinate, at the end convex and a little decurved; ridge very broad, convex, with a slight median carina, and separated on each side, from the sides, which are nearly perpendicular, slightly convex, and have an additional narrow jointed piece below the eye; edges sharp, direct, irregularly serrate, with numerous slender cuts directed backwards; tip compressed, a little decurved, rather acute. No external nostrils. Lower mandible with the angle very long and narrow, the dorsal line straight, ascending, the sides erect, convex, the edges sharp and serrated, the tip compressed and sharp.

Head large; neck of moderate length and very thick, body of moderate bulk, rather elongated; wings long. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, at its upper part anteriorly with rather large roundish-flat scales, in the rest of its extent with very small oblong tubercles; anteriorly there are three lines of small transversely oblong scutella, which run down the toes. The latter are long and slender, all united by membranes, which are reticularly granulated, and have their margins straight; first toe rather small, directed inwards and forwards, middle toe longest, the outer almost equal. Claws of moderate size, slightly arched, those of the first and middle toes depressed, the latter with its inner edge thin and pectinated.

Plumage generally close, rather compact, the feathers small and rounded: those on the head and neck blended and slightly glossed. A bare space

between the bill and the eye, surrounding the latter, and extending an inch behind the angle of the mouth. The gular membrane also bare for a small breadth, extending two inches beyond the base of the mandible. About a quarter of an inch of the tibia bare. Wings very long, narrow, acute; primaries strong, narrow, tapering rapidly at a rounded point; first longest, second about a quarter of an inch shorter, the rest rapidly graduated; secondaries short, rather broad, rounded, with a minute acumen. Tail rather long, cuneate, of twelve narrow tapering feathers.

Bill pale bluish-grey, tinged with green towards the base; the lines on the upper mandible blackish-blue; the bare space about the eye, and that on the throat, blackish-blue. Iris white. Tarsi, toes, and webs, brownish-black, the bands of narrow scutella on the tarsus and toes light greenish-blue; claws greyish-white. The general colour of the plumage is white; the upper part of the head and the hind neck of a fine buff-colour. Primary quills brownish-black, their shafts white toward the base.

Length to end of tail 40½ inches, to end of wings 38¼, to end of claws 41; extent of wings 75; wing from flexure 20¾; tail 10; bill along the ridge 4, along the edge of lower mandible 6; tarsus $2\frac{3}{12}$; first toe and claw 1¼; middle toe $3\frac{8}{12}$, its claw $\frac{7}{12}$; outer toe $3\frac{8}{12}$; its claw $\frac{4}{12}$. Weight 7 lbs.

The female is similar to the male, but rather smaller.

Young fully fledged.

Bill light greyish-brown; the bare space around the eye pale greyish-blue. Iris green. Feet dusky, the narrow bands of scutella pale greyish-blue; claws greyish-white. The head, neck, and upper parts are chocolate-brown, each feather with a terminal narrow triangular white spot; the lower parts greyish-white, spotted with greyish-brown; each feather having a broad terminal margin of that colour. The quills and tail-feathers are brownish-black. An individual shot in October measured as follows:—

Length to end of tail 38 inches, to end of claws 32½; extent of wings 72. Weight 3 lbs. 4 oz. This individual, however, was very poor.

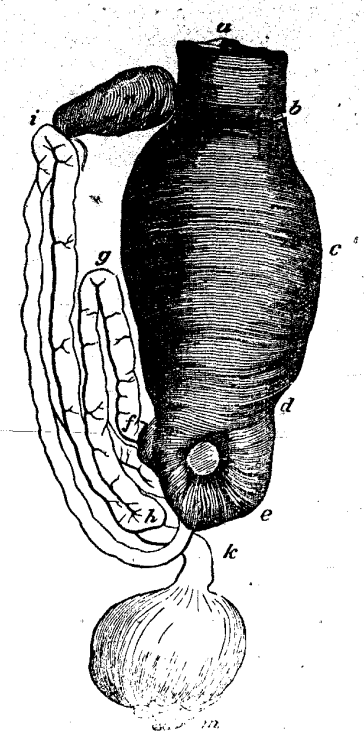
Three individuals shot in the neighbourhood of Boston, Massachusetts, presented the following dimensions, which are here given as indicative of the difference of size frequently observed:—

Length to end of tail, . .	38¾	38¾	37
. . . . . wings, . .	37½	37½	35
. . . . . claws, . .	34¼	34½	33
Extent of wings, . . .	73½	72	68½
Wing from flexure, . . .	19½	17½	19½

An adult Male killed near Boston. The cellular tissue of the back exhibits vacuities of very large size, intervening between the skin and the muscles: one, at the lower part of the neck behind, being 5 inches in length;

another 5½ inches long, extending from the furcula down the humerus; and behind the wings four others, extending to the last rib. Branches from these pass between the muscles, which present the appearance of having been as it were dissected. A cell of enormous size covers the side of the abdomen, and another pair run down the middle of it, separated by a partition in the median line. That part of the cellular tissue which adheres to the bases of the feathers is also remarkably loose; and, close to each of them, is a roundish aperture of large size, communicating with the great cavities mentioned above. Between the pectoralis major and the subjacent muscles is a large interspace formed by a great cell. The internal thoracic and abdominal cells are also very large.

On the roof of the mouth are five sharp ridges. The nasal aperture is 1 inch and 5 twelfths long, linear, with a soft longitudinal flap on each side. The tongue is extremely small, being only 7 twelfths long, 1 twelfth broad, blunt at the extremity, and with two papillæ at the base. The bare skin between the crura of the mandibles is of the same structure as that of the Pelicans and Cormorants, but of small extent, its posterior acute extremity not extending farther than that at the base of the bill. The aperture of the glottis is 7½ twelfths long. The thyroid bone has an anterior curved prolongation, which projects forwards, and from the extremity of which comes the elastic ligament by which it is connected with the hyoid bone. The œsophagus, *a*, *b*, is 15 inches long, measured to the commencement of the proventriculus, extremely dilated, its diameter 2½ inches at the top, contracting to 2 inches as it enters the thorax, its narrowest part 1 inch 4 twelfths; its transverse muscular fibres moderately strong. The proventriculus, *c*, *d*, is excessively large, 3½ inches long, its greatest diameter 2¾ inches. The glandules are cylindrical, 3 twelfths long, forming a very broad belt, separated however at its narrowest part by a longitudinal interval of 5 twelfths of an inch, and having three partial divisions on its lower edge. The greatest length of the proventriculus, or breadth of the belt of glandules, is 2½ inches. The mucous coat of the œsophagus is smooth, but thrown into longitudinal plicæ when contracted; that of the proventriculus is continuous, and of the same nature, being marked with extremely minute reticulated lines, of which the more prominent have a longitudinal direction. The stomach, properly so called, *d e*, is extremely small, being only 1 inch 9 twelfths long, and about the same breadth. Its inner coat is similar to that of the œsophagus and proventriculus, being destitute of epithelium; several large mucous crypts are scattered over its surface. The pylorus is small, having a diameter of nearly 3 twelfths, and a marginal flap or valve on one side. The intestine, *f*, *g*, *h*, is of moderate length, measuring 53 inches. The duodenum *at first passes upwards* in the direction of the liver for 2



inches, *f g* is then recurved for 3 inches, *g*, *h*, ascends for 4 inches, *h*, *i*, and receives the biliary ducts, then passes toward the spine and forms a curvature. The average diameter of the intestine is 5 twelfths at the upper part, and it gradually contracts to 3 twelfths. The rectum, *k*, measured to the anus, is 5¼ inches. It gradually enlarges from 4 to 6½ twelfths. The cloaca, *m*, is globular, 9 twelfths long, 8 twelfths broad. The cœca are 3 twelfths long, 1½ twelfths broad.

The lobes of the liver are extremely unequal, as is always the case when the stomach or the proventriculus is excessively large, the right lobe being 2¾ inches long, the left 1 inch and 8 twelfths. The gall-bladder, *n*, is very large, of an oblong form, rounded at both ends, 1 inch and 8 twelfths long.

The trachea is 12 inches long, moderately ossified, round, its diameter at the top 7 twelfths, gradually narrowing to 4 twelfths; the rings 124, the lower 4 united. The bronchi are large, their diameter greater than that of the lower part of the trachea; of 25 cartilaginous half-rings. The lateral or contractor muscles of the trachea are of moderate strength; the sterno-tracheals strong; a pair of inferior laryngeal muscles attached to the glandular-looking, yellowish-white bodies inserted upon the membrane between the first and second rings of the bronchi.

The olfactory nerve comes off from the extreme anterior point of the cerebrum, enters a canal in the spongy tissue of the bone, and runs in it close to the septum between the eyes for 10 twelfths of an inch, with a slight curve. It then enters the nasal cavity, which is of an irregular triangular form, 1½ inches long at the external or palatal aperture, 10 twelfths in height. The supramaxillary branch of the fifth pair runs along the upper edge of the orbit, and by a canal in the spongy tissue of the bones, enters the great cavity of the upper mandible, keeping nearer its lower surface, and their branches. This cavity appears to have no communication with the nasal; nor has the latter any passage towards the obliterated external nostrils

The lachrymal duct passes obliquely inwards from the anterior corner of the eye, and enters the nasal cavity by an aperture ⅛ twelfth in diameter, near its anterior margin.

In the cloaca was found a solid calculus, half an inch in diameter, of an irregular form, white within, externally pale yellowish-brown, and marked with grooves impressed by the action of the sphincter ani.

The digestive and respiratory organs of the American Gannet are thus precisely similar to those of the European. In external form, proportions, and colours, there are no appreciable differences. The young in all stages are similar. The flight, voice, general habits, and all other circumstances, are the same. What, then, shall we say to those who have pretended that the American bird differs from the European? Merely this, compare the two, outside and inside, shew us differences, and then we shall judge if they be sufficient to indicate different species; but until you have done this, do not imagine that a mere "*Sula Americana* Nob.," is enough to satisfy the world on this or any similar point.

THE BOOBY GANNET.

SULA FUSCA, *Linn.*

PLATE CCCCXXVI.—MALE.

As the Marion was nearing the curious islets of the Tortugas, one of the birds that more particularly attracted my notice was of this species. The nearer we approached the land, the more numerous did they become, and I felt delighted with the hope that ere many days should elapse, I should have an opportunity of studying their habits. As night drew her sombre curtain over the face of nature, some of these birds alighted on the top-yard of our bark, and I observed ever afterwards that they manifested a propensity to roost at as great a height as possible above the surrounding objects, making choice of the tops of bushes, or even upright poles, and disputing with each other the privilege. The first that was shot at, was approached with considerable difficulty: it had alighted on the prong of a tree which had floated and been fastened to the bottom of a rocky shallow at some distance from

Booby Gannet

Male

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.ed Printed & Col.d by J. T. Bowen, Phila.a

shore; the water was about four feet deep and quite rough; sharks we well knew were abundant around us; but the desire to procure the bird was too strong to be overcome by such obstacles. In an instant, the pilot and myself were over the sides of the boat, and onward we proceeded with our guns cocked and ready. The yawl was well manned, and its crew awaiting the result. After we had struggled through the turbulent waters about a hundred yards, my companion raised his gun and fired; but away flew the bird with a broken leg, and we saw no more of it that day. Next day, however, at the same hour, the Booby was seen perched on the same prong, where, after resting about three hours, it made off to the open sea, doubtless in search of food.

About eight miles to the north-east of the Tortugas lighthouse, lies a small sand-bar a few acres in extent, called Booby Island, on account of the number of birds of this species that resort to it during the breeding-season, and to it we accordingly went. We found it not more than a few feet above the surface of the water, but covered with Boobies, which lay basking in the sunshine, and pluming themselves. Our attempt to land on the island before the birds should fly off, proved futile, for before we were within fifty yards of it, they had all betaken themselves to flight, and were dispersing in various directions. We landed, however, distributed ourselves in different parts, and sent the boat to some distance, the pilot assuring us that the birds would return. And so it happened. As they approached, we laid ourselves as flat as possible in the sand, and although none of them alighted, we attained our object, for in a couple of hours we procured thirty individuals of both sexes and of different ages, finding little difficulty in bringing them down as they flew over us at a moderate height. The wounded birds that fell on the ground made immediately for the water, moving with more ease than I had expected from the accounts usually given of the awkward motions of these birds on the land. Those which reached the water swam off with great buoyancy, and with such rapidity, that it took much rowing to secure some of them, while most of those that fell directly into the sea with only a wing broken, escaped. The island was covered with their dung, the odour of which extended to a considerable distance leeward. In the evening of the same day we landed on another island, named after the Noddy, and thickly covered with bushes and low trees, to which thousands of that species of Tern resort for the purpose of breeding. There also we found a great number of Boobies. They were perched on the top branches of the trees, on which they had nests, and here again we obtained as many as we desired. They flew close over our heads, eyeing us with dismay but in silence; indeed, not one of these birds ever emitted a cry, except at the moment when they rose from their perches or from the sand. Their note

is harsh and guttural, somewhat like that of a strangled pig, and resembling the syllables *hork, hork*.

The nest of the Booby is placed on the top of a bush at a height of from four to ten feet. It is large and flat, formed of a few dry sticks, covered and matted with sea-weeds in great quantity. I have no doubt that they return to the same nest many years in succession, and repair it as occasion requires. In all the nests which I examined, only one egg was found, and as most of the birds were sitting, and some of the eggs had the chick nearly ready for exclusion, it is probable that these birds raise only a single young one, like the Common Gannet or Solan Goose. The egg is of a dull white colour, without spots, and about the size of that of a common hen, but more elongated, being $2\frac{3}{8}$ inches in length, with a diameter of $1\frac{3}{4}$. In some nests they were covered with filth from the parent bird, in the manner of the Florida Cormorant. The young, which had an uncouth appearance, were covered with down ; the bill and feet of a deep livid blue or indigo colour. On being touched, they emitted no cry, but turned away their heads at every trial. A great quantity of fish lay beneath the trees in a state of putrefaction, proving how abundantly the young birds were supplied by their parents. Indeed, while we were on Noddy Island, there was a constant succession of birds coming in from the sea with food for their young, consisting chiefly of flying-fish and small mullets, which they disgorged in a half macerated state into the open throats of their offspring. Unfortunately the time afforded me on that coast was not sufficient to enable me to trace the progress of their growth. I observed, however, that none of the birds which were still brown had nests, and that they roosted apart, particularly on Booby Island, where also many barren ones usually resorted, to lie on the sand and bask in the sun.

The flight of the Booby is graceful and extremely protracted. They pass swiftly at a height of from twenty yards to a foot or two from the surface, often following the troughs of the waves to a considerable distance, their wings extended at right angles to the body ; then, without any apparent effort, raising themselves and allowing the rolling waters to break beneath them, when they tack about, and sweep along in a contrary direction in search of food, much in the manner of the true Petrels. Now, if you follow an individual, you see that it suddenly stops short, plunges headlong into the water, pierces with its powerful beak and secures a fish, emerges again with inconceivable ease, after a short interval rises on wing, performs a few wide circlings, and makes off toward some shore. At this time its flight is different, being performed by flappings for twenty or thirty paces, with alternate sailings of more than double that space. When overloaded with food,

they alight on the water, where, if undisturbed, they appear to remain for hours at a time, probably until digestion has afforded them relief.

The range to which this species confines itself along our coast, seldom extends beyond Cape Hatteras to the eastward, but they become more and more numerous the farther south we proceed. They breed abundantly on all such islands or keys as are adapted for the purpose, on the southern and western coasts of the Floridas and in the Gulf of Mexico, where I was told they breed on the sand-bars. Their power of wing seems sufficient to enable them to brave the tempest, while during a continuance of fair weather they venture to a great distance seaward, and I have seen them fully 200 miles from land.

The expansibility of the gullet of this species enables it to swallow fishes of considerable size, and on such occasions their mouth seems to spread to an unusual width. In the throats of several individuals that were shot as they were returning to their nests, I found mullets measuring seven or eight inches, that must have weighed fully half a pound. Their body, beneath the skin, is covered with numerous air-cells, which probably assist them in raising or lowering themselves while on wing, and perhaps still more so when on the point of performing the rapid plunge by which they secure their prey.

Their principal enemies during the breeding-season are the American Crow and the Fish Crow, both of which destroy their eggs, and the Turkey Buzzard, which devours their young while yet unfledged. They breed during the month of May, but I have not been able to ascertain if they raise more than one brood in the season. The adult birds chase away those which are yet immature during the period of incubation. It would seem that they take several years in attaining their perfect state.

When procured alive, they feed freely, and may be kept any length of time, provided they are supplied with fish. No other food, however, could I tempt them to swallow, excepting slices of turtle, which after all they did not seem to relish. In no instance did I observe one drinking. Some authors have stated that the Frigate Pelican and the Lestris force the Booby to disgorge its food that they may obtain it; but this I have never witnessed. Like the Common Gannet, they may be secured by fastening a fish to a soft plank, and sinking it a few feet beneath the surface of the water, for if they perceive the bait, which they are likely to do if they pass over it, they plunge headlong upon it, and drive their bill into the wood.

When a Booby has alighted on the spar of a vessel, it is no easy matter to catch it, unless it is much fatigued; but if exhausted and asleep, an expert seaman may occasionally secure one. I was informed that after the breeding-season, these birds roost on trees in company with the Brown Pelican

and a species of Tern, *Sterna stolida*, and spend their hours of daily rest on the sand-banks. Our pilot, who was a man of great observation, assured me that while at Vera Cruz, he saw the fishermen there go to sea, and return from considerable distances, simply by following the course of the Boobies.

The bills and legs of those which I procured in the brown plumage, and which were from one to two years of age, were dusky-blue. These were undergoing moult on the 14th of May. At a more advanced age, the parts mentioned become paler, and when the bird has arrived at maturity, are as represented in my plate. I observed no external difference between the sexes in the adult birds. The stomach is a long dilatable pouch, thin, and of a yellow colour. The body is muscular, and the flesh, which is of a dark colour, tough, and having a disagreeable smell, is scarcely fit for food.

I am unable to find a good reason for those who have chosen to call these birds *boobies*. Authors, it is true, generally represent them as extremely *stupid;* but to me the word is utterly inapplicable to any bird with which I am acquainted. The Woodcock, too, is said to be stupid, as are many other birds; but my opinion, founded on pretty extensive observation, is, that it is only when birds of any species are unacquainted with man, that they manifest that kind of *ignorance* or *innocence* which he calls *stupidity*, and by which they suffer themselves to be imposed upon. A little acquaintance with him soon enables them to perceive enough of his character to induce them to keep aloof. This I observed in the Booby Gannet, as well as in the Noddy Tern, and in certain species of land birds of which I have already spoken. After my first visit to Booby Island in the Tortugas, the Gannets had already become very shy and wary, and before the Marion sailed away from those peaceful retreats of the wandering sea birds, the *Boobies* had become so knowing, that the most expert of our party could not get within shot of them.

Sula fusca, Bonap. Syn., p. 408.
Booby, *Sula fusca*, Nutt. Man., vol. ii. p. 500.
Booby Gannet, *Sula fusca*, Aud. Orn. Biog., vol. iii. p. 63.

Male, 31, 49¼.

Gulf of Mexico, and as far east as the coast of Georgia. Breeds on the Tortugas Keys, south of Florida. Abundant. Migratory.

Adult Male.

Bill longer than the head, opening beyond the eyes, straight, elongated-conical, broader above than beneath at the base, compressed. Upper mandible with the dorsal line convex at the base, then a little concave, and towards the tip slightly arched, ridge very broad, convex, separated by a seam on each side from the sides, which are nearly perpendicular, edges

sharp, inflected, serrated, tip acute. No external nostrils. Lower mandible prolonged at the base behind the upper, its angle very long, wide at the base, with a bare membrane, very narrow towards the end, dorsal line straight, ascending, sides convex, tip very acute, edges serrated towards the end.

Head rather large; neck rather long and thick; body of moderate bulk, rather elongated; wings long. Feet short, strong, placed rather far behind; tibiæ concealed; tarsus very short, rounded before, sharp behind, covered all round with reticular scales; toes all united by membranes; first very short, being about half the length of the second, third and fourth longest and nearly equal, but the claw of the third is much longer than that of the fourth; claws small, compressed, acute, curved, that of the third toe largest, depressed, curved outwards, with a thin pectinated inner edge.

Plumage generally short, close, rather compact, the feathers small and rounded; those on the head very small; loral and orbital spaces bare, as is that in the angle of the lower mandible, and a short space above the tibio-tarsal joint; wings long, acute, narrow; primaries strong, narrow, tapering rapidly to a rounded point, first and second longest and about equal, the rest rapidly graduated; secondaries short, rather broad, narrowed towards the rounded point. Tail rather long, cuneate, of twelve narrow, tapering feathers.

Bill and naked parts at its base bright yellow, pale flesh-coloured towards the end; a dusky spot before the eye. Iris white. Tarsi, toes, and their connecting webs, pale yellow, claws white. Head, neck all round, upper parts in general, and lower surface of wings, dusky-brown, tinged with grey; the breast, abdomen, and lower tail-coverts, pure white.

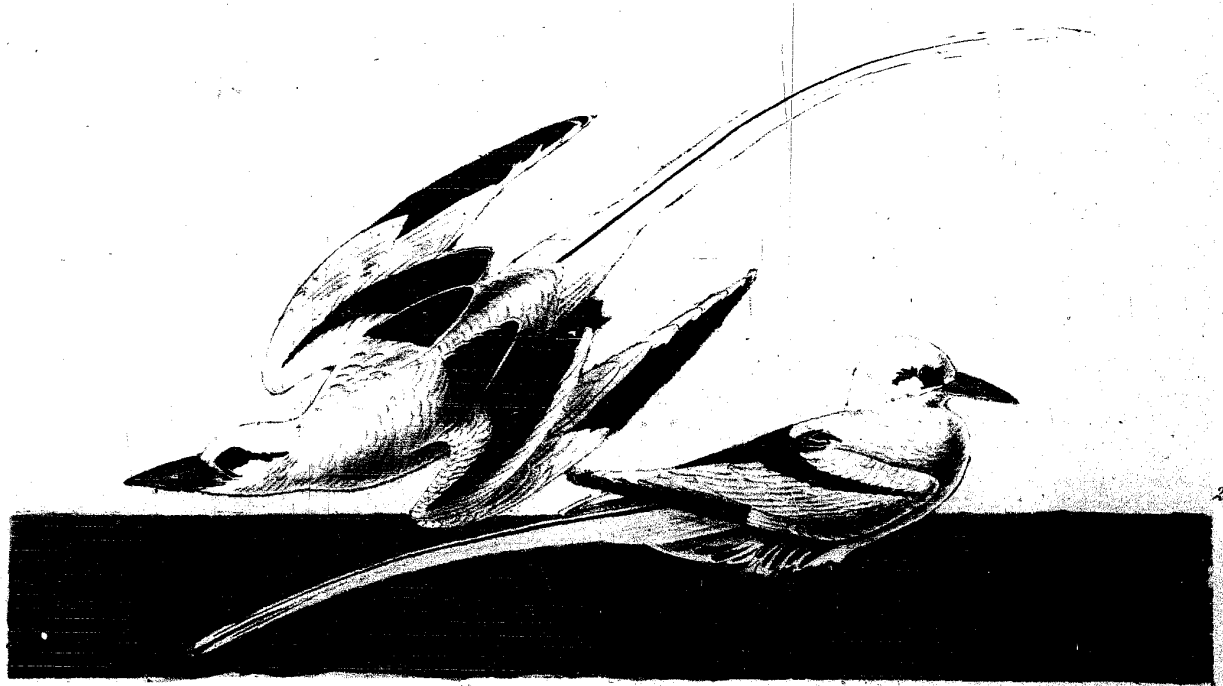
Length 31 inches, to end of claws 27, extent of wings 29¼; bill along the back 3$\frac{1}{16}$, along the edge 5; tarsus 1$\frac{3}{16}$, middle toe and claw 3½. Wing from flexure 16½, tail 8½. Weight 3 lbs. 4½ oz.

The Female resembles the male, but is smaller.

The Young, when fledged, are of a greyish-brown colour all over, the breast and abdomen being merely a little lighter than the rest. The bill and claws are dusky, the tarsi and toes with their membranes dull yellow.

GENUS VI.—PHAETON, *Linn.* TROPIC BIRD.

Bill as long as the head, stout, very much compressed, slightly curved, tapering, acute, opening to beneath the eye; upper mandible with the dorsal line slightly arched, the ridge narrow, rounded, the sides sloping and slightly convex at the base, nearly erect towards the end, the edges sharp, direct, irregularly broken, the tip acuminate; nasal groove short, near the ridge; lower mandible with the angle long, and extremely narrow, the dorsal line straight and ascending, the sides erect and slightly convex, the tip acuminate. Nostrils basal, linear, very small. Head rather large, ovate; neck short and thick; body rather full. Feet very short; tibia bare for a considerable space; tarsus extremely short, roundish, covered with small round scales; toes rather small, placed in the same plane, and connected by reticulated webs; first very small, third a little longer than fourth, all scutellate above. Claws small, arched, compressed, rather sharp, that of the third toe with a thin entire inner edge. Plumage soft, blended, on the back rather compact. Wings long, acute, the first quill longest. Tail of twelve feathers, tapering, the two middle feathers extremely elongated, narrow, and tapering. This genus appears to be intermediate between Sula and Sterna.



Tropic Bird

1 Male 2 Female

Drawn from Nature by J.J.Audubon FRSFLS

Lith.d Printed & Col.d by J.T.Bowen. Philad.a

THE TROPIC BIRD.

PHAETON ÆTHEREUS, *Linn.*

PLATE CCCCXXVII.—ADULT MALE AND FEMALE.

The specimens from which the figures in the plate were taken, were obtained on the Tortugas, in the summer of 1832, by my kind friend ROBERT DAY, Esq., of the United States revenue cutter Marion. They were shot out of a flock of eight or ten, and were in fine condition. I have represented the male and female, in what I suppose to be their full summer or breeding plumage; but not having had an opportunity of studying the habits of this remarkable bird, I am unable to give any information respecting them.

PHAETON ÆTHEREUS, Bonap. Syn., p. 409.
TROPIC BIRD, Nutt. Man., vol. ii. p. 503.
TROPIC BIRD, *Phaeton æthereus*, Aud. Orn. Biog., vol. iii. p. 442.

Male, 29½, 38. Female, 26, 34.
Rare on the coast of Florida. Migratory.
Adult Male in summer.

Bill as long as the head, stout, very much compressed, slightly curved, tapering, acute. Upper mandible with the dorsal line slightly arched, the ridge narrow, but rounded, the sides sloping and slightly convex at the base, nearly perpendicular towards the end, the edges sharp, irregularly broken, the tip acute. Nasal groove short, near the ridge; nostrils linear, very small. Lower mandible with the angle of moderate length, extremely narrow, the dorsal line straight and ascending, the sides erect and slightly convex, the edges sharp but irregularly serrated, the tip very acute.

Head rather large, ovate. Neck short and thick. Body rather full. Feet very short; tibia bare for a considerable space; tarsus extremely short, roundish, covered all round with small round scales; toes rather small, placed in the same plane, and connected by reticulated webs; the first toe very small, the third and fourth about equal, all scutellate above. Claws small, arched, compressed, rather sharp, that of middle toe largest, with an undulated thin inner edge.

Plumage soft, blended, on the back and wings rather compact. Wings

long, acute; primaries strong, tapering, the first longest, the rest rapidly graduated; secondaries very short, incurved, rounded, the inner longer. Tail of twelve feathers, wedge-shaped, the two middle feathers extremely elongated, narrow, and tapering.

Bill orange-red. Iris brown. Tarsi and base of toes yellow, the rest and the webs black, as are the claws. The general colour of the plumage is pale pink, or white tinged with carmine, the two middle tail feathers redder. A curved spot before the eye, and band behind it, black. A band of the same colour extends across the wing from the flexure, running narrow along the middle coverts, much enlarged on the inner secondaries and their coverts, and including the extremities of the scapulars. The outer webs, shafts, and a portion of the inner webs of the first four primary quills, are also black, and there is a spot of the same on some of the primary coverts. The shafts of the two middle tail feathers are black, excepting towards the end; and some of the long hypochondrical feathers are greyish-black in the centre.

Length to end of tail 29½ inches, to end of wings 16, to end of claw 14; extent of wings 38; wing from flexure 11¼; tail 19⅛; bill along the ridge 2, along the edge of lower mandible 2⅜; tarsus 1$\frac{9}{12}$; middle toe 1$\frac{6}{12}$, its claw $\frac{11}{12}$. Weight 15 oz.

Adult Female.

The female resembles the male, but is less tinged with red. The bill is yellow, the iris and feet as in the male. The tail-feathers are also less elongated.

Length to end of tail 26 inches, to end of wings 14¼, to end of claws 13; wing from flexure 11; tail 16; extent of wings 34; bill along the ridge $\frac{11}{12}$, along the edge of lower mandible 2⅛; tarsus $\frac{9}{12}$; middle toe 1$\frac{6}{12}$, its claw $\frac{11}{12}$. Weight 12 oz.

FAMILY XLII.—LARINÆ. GULLS.

Bill of moderate length, straight, compressed, acute; upper mandible with the dorsal line generally straight until toward the end, when it is decurved, the ridge convex, the nasal groove rather long, the edges sharp, direct, overlapping, the tip rather acute and declinate; lower mandible with the angle long and very narrow, the dorsal line ascending and nearly straight, with an angular prominence at its commencement. Nostrils submedial or basal, oblong. Head of moderate size, ovate; neck of moderate length; body rather stout. Legs short or of moderate length; tibia bare at its lower part; tarsus anteriorly scutellate; toes four, the first very small, free, the third longest; anterior toes connected by webs. Claws small, arched, compressed, rather acute. Plumage full, soft, blended, somewhat compact on the back and wings, the latter long and pointed; tail of twelve feathers, even, rounded, or emarginate. Tongue long, slender, pointed; œsophagus very wide; stomach rather small, moderately muscular, with a dense, longitudinally rugous epithelium; intestine of moderate length and width; cœca small; cloaca globular. Trachea simple, with a single pair of inferior laryngeal muscles. Nest on the ground, rudely constructed. Eggs few, not exceeding four, spotted. Young covered with down.

Genus I.—RHYNCHOPS, *Linn.* SKIMMER.

Bill longer than the head, nearly straight, tetragonal at the base, suddenly extremely compressed and continuing so to the end; upper mandible much shorter than the lower, its ridge sharp, the sides erect but a little convex, the edges approximated so as to leave merely a very narrow groove between them, the tip a little rounded, when viewed laterally; nasal groove rather short, near the margin; lower mandible with the angle extremely short, the dorsal line straight or slightly decurved, the sides erect, obliquely grooved, the edges united into a very thin blade, which fits into the narrow groove of the upper mandible, the tip rounded or abrupt, when viewed laterally. Nostrils linear-oblong. Head rather large, oblong, considerably elevated in

front; neck rather short, thick; body short, ovate. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, anteriorly covered with broad scutella; toes very small, the first extremely short and free, unless at the base; middle toe slightly longer than outer; anterior toes united by deeply emarginate webs. Claws long, compressed, slightly arched, rather obtuse. Plumage moderately full, soft, and blended; wings extremely long, and very narrow; primary quills excessively long, the first longest; secondaries short. Tail of moderate length, deeply forked, of twelve feathers. Tongue short, triangular, tapering; œsophagus wide; stomach rather small, oblong, muscular, the cuticular lining dense, with nine broad longitudinal rugæ; intestine rather long, narrow; cœca very small; cloaca large, globular; the digestive organs are precisely similar to those of the Terns and smaller Gulls.

BLACK SKIMMER OR RAZOR-BILLED SHEARWATER.

RHYNCHOPS NIGRA, *Linn.*

PLATE CCCCXXVIII.—MALE.

This bird, one of the most singularly endowed by nature, is a constant resident on all the sandy and marshy shores of our more southern States, from South Carolina to the Sabine river, and doubtless also in Texas, where I found it quite abundant in the beginning of spring. At this season parties of Black Skimmers extend their movements eastward as far as the sands of Long Island, beyond which however I have not seen them. Indeed in Massachusetts and Maine this bird is known only to such navigators as have observed it in the southern and tropical regions.

To study its habits, therefore, the naturalist must seek the extensive sandbars, estuaries, and mouths of the rivers of our Southern States, and enter the sinuous bayous intersecting the broad marshes along their coasts. There, during the warm sunshine of the winter days, you will see thousands of Skimmers, covered as it were with their gloomy mantles, peaceably lying beside each other, and so crowded together as to present to your eye the appearance of an immense black pall accidentally spread on the sand. Such


N°86.
Pl. 428
Black Skimmer or Shearwaters
Male.
Drawn from Nature by J.J.Audubon FRSFLS
Lith.Printed & Col.d by J.T.Bowen Philad.a

times are their hours of rest, and I believe of sleep, as, although partially diurnal, and perfectly able to discern danger by day, they rarely feed then, unless the weather be cloudy. On the same sands, yet apart from them, equal numbers of our Black-headed Gulls may be seen enjoying the same comfort in security. Indeed, the Skimmers are rarely at such times found on sand or gravel banks which are not separated from the neighbouring shores by some broad and deep piece of water. I think I can safely venture to say that in such places, and at the periods mentioned, I have seen not fewer than ten thousand of these birds in a single flock. Should you now attempt to approach them, you will find that as soon as you have reached within twice the range of your long duck-gun, the crowded Skimmers simultaneously rise on their feet, and watch all your movements. If you advance nearer, the whole flock suddenly taking to wing, fill the air with their harsh cries, and soon reaching a considerable height, range widely around, until, your patience being exhausted, you abandon the place. When thus taking to wing in countless multitudes, the snowy white of their under parts gladdens your eye, but anon, when they all veer through the air, the black of their long wings and upper parts produces a remarkable contrast to the blue sky above. Their aërial evolutions on such occasions are peculiar and pleasing, as they at times appear to be intent on removing to a great distance, then suddenly round to, and once more pass almost over you, flying so close together as to appear like a black cloud, first ascending, and then rushing down like a torrent. Should they see that you are retiring, they wheel a few times close over the ground, and when assured that there is no longer any danger, they alight pell-mell, with wings extended upwards, but presently closed, and once more huddling together they lie down on the ground, to remain until forced off by the tide. When the Skimmers repose on the shores of the mainland during high water, they seldom continue long on the same spot, as if they felt doubtful of security ; and a person watching them at such times might suppose that they were engaged in searching for food.

No sooner has the dusk of evening arrived than the Skimmers begin to disperse, rise from their place of rest singly, in pairs, or in parties from three or four to eight or ten, apparently according to the degree of hunger they feel, and proceed in different directions along parts of the shores previously known to them, sometimes going up tide-rivers to a considerable distance. They spend the whole night on wing, searching diligently for food. Of this I had ample and satisfactory proof when ascending the St. John river in East Florida, in the United States schooner Spark. The hoarse cries of the Skimmers never ceased more than an hour, so that I could easily know whether they were passing upwards or downwards in the

dark. And this happened too when I was at least a hundred miles from the mouth of the river.

Being aware, previously to my several visits to the peninsula of the Floridas and other parts of our southern coasts where the Razor-bills are abundant, of the observations made on this species by M. LESSON, I paid all imaginable attention to them, always aided by an excellent glass, in order to find whether or not they fed on bivalve shell-fish found in the shallows of sand-bars and other places at low water; but not in one single instance did I see any such occurrence, and in regard to this matter I agree with WILSON in asserting that, while with us, these birds do not feed on shell-fish. M. LESSON's words are as follows:—"Quoique le Bec-en-ciseaux semble defavorisé par la forme de son bec, nous acquimes la preuve qu'il savait s'en servir avec avantage et avec la plus grande adresse. Les plages sabloneuses de Peuce sont en effect remplies de Mactres, coquilles bivalves, que la marée descendante laisse presque à sec dans des petites mares; le Bec-en-ciseaux très au fait de cet phemomène, se place auprès de ces mollusques, attend que leur valves s'entrouvrent un peu, et profite aussitot de ce movement en enforçant la lame infericure et tranchante de son bec entre les valves qui se reserrent. L'oiseau enleve alors la coquille, la frappe sur la grève, coupe le ligament du mollusque, et peut ensuite avaler celui-ci sans obstacle. Plusieurs fois nous avons été temoins de cet instinct très perfectionné."

While watching the movements of the Black Skimmer as it was searching for food, sometimes a full hour before it was dark, I have seen it pass its lower mandible at an angle of about 45 degrees into the water, whilst its *moveable* upper mandible was elevated a little above the surface. In this manner, with wings raised and extended, it ploughed as it were, the element in which its quarry lay to the extent of several yards at a time, rising and falling alternately, and that as frequently as it thought it necessary for securing its food when in sight of it; for I am certain that these birds never immerse their lower mandible until they have observed the object of their pursuit, for which reason their eyes are constantly directed downwards like those of Terns and Gannets. I have at times stood nearly an hour by the side of a small pond of salt water having a communication with the sea or a bay, while these birds would pass within a very few yards of me, then apparently quite regardless of my presence, and proceed fishing in the manner above described. Although silent at the commencement of their pursuit, they become noisy as the darkness draws on, and then give out their usual call notes, which resemble the syllables *hurk*, *hurk*, twice or thrice repeated at short intervals, as if to induce some of their companions to follow in their wake. I have seen a few of these birds glide in this manner in search of prey over a long salt-marsh bayou, or inlet, following the whole of its sinu

osities, now and then lower themselves to the water, pass their bill along the surface, and on seizing a prawn or a small fish, instantly rise, munch and swallow it on wing. While at Galveston Island, and in the company of my generous friend EDWARD HARRIS and my son, I observed three Black Skimmers, which having noticed a Night Heron passing over them, at once rose in the air, gave chase to it, and continued their pursuit for several hundred yards, as if intent on overtaking it. Their cries during this chase differed from their usual notes, and resembled the barkings of a very small dog.

The flight of the Black Skimmer is perhaps more elegant than that of any water bird with which I am acquainted. The great length of its narrow wings, its partially elongated forked tail, its thin body and extremely compressed bill, all appear contrived to assure it that buoyancy of motion which one cannot but admire when he sees it on wing. It is able to maintain itself against the heaviest gale; and I believe no instance has been recorded of any bird of this species having been forced inland by the most violent storm. But, to observe the aërial movements of the Skimmer to the best advantage, you must visit its haunts in the love season. Several males, excited by the ardour of their desires, are seen pursuing a yet unmated female. The coy one, shooting aslant to either side, dashes along with marvellous speed, flying hither and thither, upwards, downwards, in all directions. Her suitors strive to overtake her; they emit their love-cries with vehemence; you are gladdened by their softly and tenderly enunciated *ha, ha*, or the *hack, hack, cae, cae*, of the last in the chase. Like the female they all perform the most curious zigzags, as they follow in close pursuit, and as each beau at length passes her in succession, he extends his wings for an instant, and in a manner struts by her side. Sometimes a flock is seen to leave a sand-bar, and fly off in a direct course, each individual apparently intent on distancing his companions; and then their mingling cries of *ha, ha, hack, hack, cae, cae*, fill the air. I once saw one of these birds fly round a whole flock that had alighted, keeping at the height of about twenty yards, but now and then tumbling as if its wings had suddenly failed, and again almost upsetting, in the manner of the Tumbler Pigeon.

On the 5th of May, 1837, I was much surprised to find a large flock of Skimmers alighted and apparently asleep, on a dry grassy part of the interior of Galveston Island in Texas, while I was watching some Marsh Hawks that were breeding in the neighbourhood. On returning to the shore, however, I found that the tide was much higher than usual, in consequence of a recent severe gale, and had covered all the sand banks on which I had at other times observed them resting by day.

The instinct or sagacity which enables the Razor-bills, after being scattered in all directions in quest of food during a long night, often at great distances

from each other, to congregate again towards morning, previously to their alighting on a spot to rest, has appeared to me truly wonderful; and I have been tempted to believe that the place of rendezvous had been agreed upon the evening before. They have a great enmity towards Crows and Turkey Buzzards when at their breeding ground, and on the first appearance of these marauders, some dozens of Skimmers at once give chase to them, rarely desisting until quite out of sight.

Although parties of these birds remove from the south to betake themselves to the eastern shores, and breed there, they seldom arrive at Great Egg Harbour before the middle of May, or deposit their eggs until a month after, or about the period when, in the Floridas and on the coast of Georgia and South Carolina, the young are hatched. To these latter sections of the country we will return, reader, to observe their actions at this interesting period. I will present you with a statement by my friend the Rev. JOHN BACHMAN, which he has inserted in my journal. "These birds are very abundant, and breed in great numbers on the sea islands at Bull's Bay. Probably twenty thousand nests were seen at a time. The sailors collected an enormous number of their eggs. The birds screamed all the while, and whenever a Pelican or Turkey Buzzard passed near, they assailed it by hundreds, pouncing on the back of the latter, that came to rob them of their eggs, and pursued them fairly out of sight. They had laid on the dry sand, and the following morning we observed many fresh-laid eggs, when some had been removed the previous afternoon." Then, reader, judge of the deafening angry cries of such a multitude, and see them all over your head begging for mercy as it were, and earnestly urging you and your cruel sailors to retire and leave them in the peaceful charge of their young, or to settle on their lovely rounded eggs, should it rain or feel chilly.

The Skimmer forms no other nest than a slight hollow in the sand. The eggs, I believe, are always three, and measure an inch and three quarters in length, an inch and three-eighths in breadth. As if to be assimilated to the colours of the birds themselves, they have a pure white ground, largely patched or blotched with black or very dark umber, with here and there a large spot of a light purplish tint. They are as good to eat as those of most Gulls, but inferior to the eggs of Plovers and other birds of that tribe. The young are clumsy, much of the same colour as the sand on which they lie, and are not able to fly until about six weeks, when you now perceive their resemblance to their parents. They are fed at first by the regurgitation of the finely macerated contents of the gullets of the old birds, and ultimately pick up the shrimps, prawns, small crabs, and fishes dropped before them. As soon as they are able to walk about, they cluster together in the manner of the young of the Common Gannet, and it is really marvellous how the

parents can distinguish them individually on such occasions. This bird walks in the manner of the Terns, with short steps, and the tail slightly elevated. When gorged and fatigued, both old and young birds are wont to lie flat on the sand, and extend their bills before them; and when thus reposing in fancied security, may sometimes be slaughtered in great numbers by the single discharge of a gun. When shot at while on wing, and brought to the water, they merely float, and are easily secured. If the sportsman is desirous of obtaining more, he may easily do so, as others pass in full clamour close over the wounded bird.

BLACK SKIMMER or SHEAR-WATER, *Rhynchops nigra*, Wils. Amer. Orn., vol. vii. p. 85.
RHINCOPS NIGRA, Bonap. Syn., p. 352.
BLACK SKIMMER, Nutt. Man., vol. ii. p. 264.
BLACK SKIMMER or RAZOR-BILLED SHEAR-WATER, *Rhynchops nigra*, Aud. Orn. Biog., vol. iv. p. 203.

Male, 20, 48. Female, 16¾, 44½.

During winter, in vast multitudes on the coast of Florida. In summer dispersed in large flocks from Texas to New Jersey, breeding on sand beaches or islands. In the evenings and at night ascends streams sometimes to the distance of one hundred miles.

Adult Male.

Bill longer than the head, nearly straight, tetragonal at the base, suddenly extremely compressed, and continuing so to the end. Upper mandible much shorter than the lower, its dorsal outline very slightly convex, its ridge sharp, the sides erect, more or less convex, the edges approximated so as to leave merely a very narrow groove between them; the tip a little rounded when viewed laterally. Nasal groove rather short, narrow near the margin; nostrils linear-oblong, sub-basal in the soft membrane. Lower mandible with the angle extremely short, the dorsal outline straight or slightly decurved, the sides erect, the edges united into a very thin blade which fits into the narrow groove of the upper mandible, the tip rounded or abrupt when viewed laterally.

Head rather large, oblong, considerably elevated in front. Neck short and thick. Body short, ovate, and compact. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, moderately compressed, anteriorly covered with broad scutella, reticulated on the sides and behind; toes very small; the first extremely short, and free; the inner much shorter than the outer, which is but slightly exceeded by the middle toe; the webs very deeply concave at the margin, especially the inner. Claws long, compressed, tapering, slightly arched, rather obtuse, the inner edge of the middle toe dilated and extremely thin. Plumage

moderately full, soft, and blended; the feathers oblong and rounded. Wings extremely elongated, and very narrow; the primary quills excessively long; the first longest, the rest rapidly graduated; the secondaries short, broad, incurved, obliquely pointed, some of the inner more elongated. Tail rather short, deeply forked, of twelve feathers, disposed in two inclined planes.

Bill of a rich carmine, inclining to vermilion for about half its length, the rest black. Iris hazel. Feet of the same colour as the base of the bill, claws black. The upper parts are deep brownish-black; the secondary quills, and four or five of the primaries, tipped with white; the latter on their inner web chiefly. Tail-feathers black, broadly margined on both sides with white, the outer more extensively; the middle tail-coverts black, the lateral black on the inner and white on the outer web. A broad band of white over the forehead, extending to the fore part of the eye; cheeks and throat of the same colour; the rest of the neck and lower parts in spring and summer of a delicate cream-colour; axillary feathers, lower wing-coverts, and a large portion of the secondary quills, white; the coverts along the edge of the wing black.

Length from point of upper mandible to end of tail 20 inches, to end of wings 24½, to end of claws 17; to carpal joint 8¼; extent of wings 48; upper mandible 3½; its edge 3⅞; from base to point of lower mandible 4½; depth of bill at the base 1; wing from flexure 15⅝; tail to the fork 3½; to end of longest feather 5¼; tarsus 1¼; hind toe and claw $\frac{4}{12}$; middle toe $\frac{7}{12}$ its claw $\frac{4}{12}$. Weight 13 oz.

The Female, which is smaller, is similar to the male, but with the tail-feathers white, excepting a longitudinal band including the shaft.

Length to end of tail 16½, to end of wings 20½, to end of claws 16¼, to carpus 8; extent of wings 44½. Weight 10 oz.

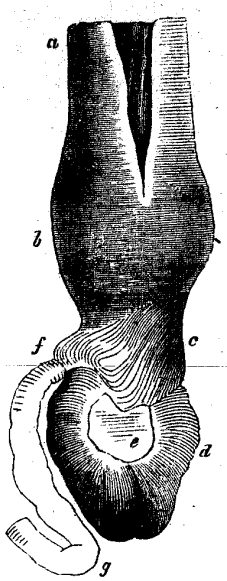
After the first autumnal moult there is on the hind part of the neck a broad band of white, mottled with greyish-black; the lower parts pure white, the upper of a duller black; the bill and feet less richly coloured.

Length to end of tail 16½ inches, to end of wings 20, to end of claws 14½; to carpus 6⅝; extent of wings 42.

In some individuals at this period the mandibles are of equal length.

The palate is flat, with two longitudinal series of papillæ directed backwards. The upper mandible is extremely contracted, having internally only a very narrow groove, into which is received the single thin edge of the lower mandible. The posterior aperture of the nares is $1\frac{3}{12}$ inches long, with a transverse line of papillæ at the middle on each side, and another behind. The tongue is sagittiform, 6½ twelfths long, with two conical papillæ at the base, soft, fleshy, flat above, horny beneath. Aperture of the glottis 4½ twelfths long, with numerous small papillæ behind. Lobes of the

liver equal, 1¼ inches long. The heart of moderate size, $1_{\frac{1}{2}}^{1}$ long, 10 twelfths broad.



The œsophagus, of which only the lower portion, *a*, is seen in the figure, is 8 inches long, gradually contracts from a diameter of 1 inch to 4 twelfths, then enlarges until opposite the liver, where its greatest diameter is $1_{\frac{4}{2}}$. Its external transverse fibres are very distinct, as are the internal longitudinal. The proventriculus, *b*, is 9 twelfths long, its glandules extremely small and numerous, roundish, scarcely a quarter of a twelfth in length. The stomach, *c d e*, is rather small, oblong, 1 inch 4 twelfths long, 11 twelfths broad, muscular, with the lateral muscles moderate. The cuticular lining of the stomach is disposed in nine broad longitudinal rugæ of a light red colour, as in the smaller Gulls and Terns. Its lateral muscles are about 4 twelfths thick, the tendons, *e*, 6 twelfths in diameter. The intestine is 2 feet 4 inches long, its average diameter 2¼ twelfths. The rectum is 2 inches long. One of the cœca is 4, the other 3 twelfths, their diameter 1¼ twelfths.

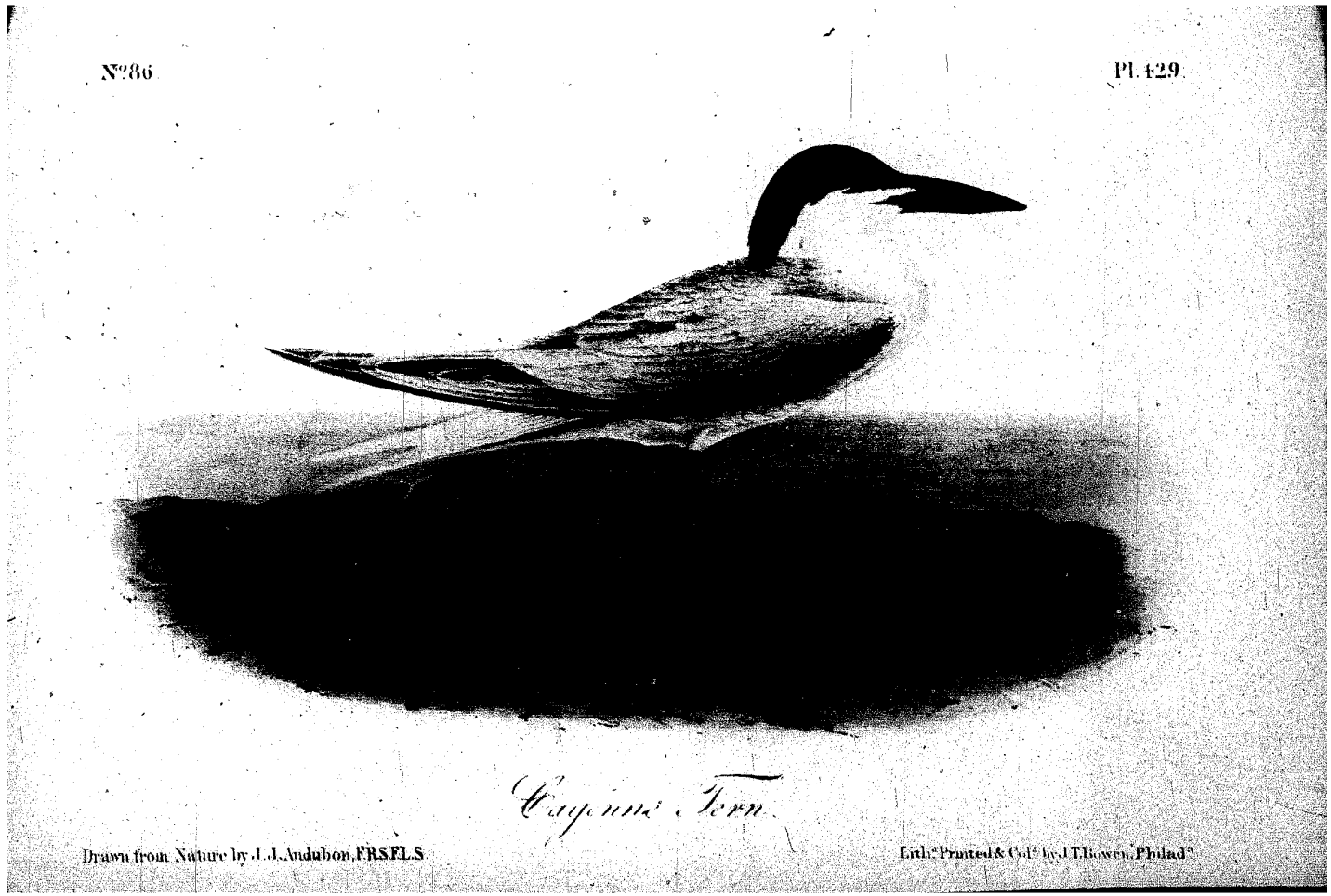
In another individual, the intestine is 22¼ inches long; the cœca 5 twelfths long, 1 twelfth in diameter; the rectum 1¾ inches long; the cloaca 9 twelfths in diameter.

The trachea is 5¾ inches long, round, but not ossified, its diameter at the top 5 twelfths, contracting gradually to 2½ twelfths. The lateral or contractor muscles are small; the sterno-tracheal slender; there is a pair of inferior laryngeals, going to the last ring of the trachea. The number of rings is 90, and a large inferior ring. The bronchi are of moderate length, but wider, their diameter being 3¼ twelfths at the upper part; the number of their half-rings about 18.

The digestive organs of this bird are precisely similar to those of the Terns and smaller Gulls, to which it is also allied by many of its habits.

Genus. II.—STERNA, *Linn.* TERN.

Bill longer than the head, rather stout or slender, nearly straight, compressed, very acute; upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, gradually narrowed toward the end, sides convex, edges sharp and direct, tip acute; nasal groove short; lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight, the sides slightly convex, nearly erect, the sharp edges inflected, the tips very acute. Nostrils basal, lateral, linear, direct. Head rather large, oblong; neck of moderate length and thick; body slender. Feet short, moderately stout; tibia bare for a considerable space; tarsus short, roundish, covered all round with small scales; first toe very small, third longest, fourth a little shorter; anterior toes connected by emarginate webs. Claws slightly curved, compressed, acute. Plumage soft, close, blended, rather compact on the back and wings. Wings extremely long, narrow, and pointed, the first quill longest, the rest rapidly graduated. Tail long, generally forked, of twelve feathers. Tongue very slender, tapering, with the point slit; œsophagus extremely wide; proventricular belt complete; stomach rather small, moderately muscular, with the epithelium dense and longitudinally rugous; intestine of moderate length, rather narrow; cœca small.


N°86
Pl. 429
Caspian Tern.
Drawn from Nature by J. J. Audubon, F.R.S. F.L.S.
Lith.ª Printed & Col.ª by J. T. Bowen, Philad.ª

THE CAYENNE TERN.

STERNA CAYANA, *Lath.*

PLATE CCCCXXIX.—MALE.

On reaching the entrance of the little port of St. Augustine in East Florida, I observed more Cayenne Terns together than I had ever before seen. I had afterwards good opportunities of watching them both during that season and the following, about the Keys. Their shyness surprised me not a little, especially as they are very seldom molested, and it was such that I could study their habits only with the aid of a good glass. I found them at first in great flocks, composed of several hundred individuals, along with Razor-billed Shearwaters, which also congregated there in great numbers. During low water, both species resorted to a large flat sand-bar in the middle of the channel, where they reposed until the return of the tide, sitting close together, in an easy posture, with their heads facing the breeze. They kept separate, however, placing themselves in parallel lines twenty or thirty paces asunder, and either lay flat on the sand, or stood up and plumed themselves. My attempts to procure some of them were always futile, for they flew off when I was yet several hundred yards distant, and moved directly towards the sea. It was pleasing to see the whole of these birds take to wing at the same moment, the jetty hue of the Shearwaters contrasting with the pale blue of the Terns, and the brilliantly-coloured bills of both species, their different modes of flight, and their various evolutions presenting a most agreeable sight. The Terns on these occasions constantly emitted their harsh loud cries, while the Shearwaters moved in perfect silence. After spending several days in unsuccessful endeavours to approach them, I employed several boats, which advanced towards the sands at several points, and we shot as many as we wished, for as the flocks passed over any of the boats, several individuals were brought down at once, on which the rest would assail the gunners, as if determined to rescue their brethren, and thus afford subjects for them on which to exercise their skill. We found it necessary to use large shot, the Cayenne Tern being a strong and tough bird, the largest of the genus met with on our Atlantic coasts. When wounded, however slightly, they disgorged in the manner of Vultures; and when brought to the water disabled, they at once endeavoured to make off from

the shores, swimming with buoyancy and grace, though without making much progress. When seized they at once erected their beautiful crest, threw up the contents of their stomach, uttered loud cries, and bit severely. One that was merely touched in the wing, and brought ashore, through a high surf, by my Newfoundland dog, stuck fast to his nose until forced to relinquish its hold by having its throat squeezed, after which it disgorged seven partially digested fishes.

Although the Cayenne Tern often searches for food over the sea, and at times several miles from the shore, it gives a decided preference to the large inlets running parallel to the coast of the Floridas, within the high sandy embankments, as well as the rivers in the interior of the peninsula. They alight on the banks of racoon oysters, so abundant in the inlets, and are seen in company with the Semipalmated Snipe and the American Oystercatcher, searching for food like these birds, and devouring crabs and such fishes as are confined in small shallow pools. These they catch with considerable agility, in a manner not employed by any of our other Terns. While on the St. John's river, I saw them alight on stakes, in the manner of the Marsh Tern and the Noddy; and as I ascended that stream, I often saw them, at the distance of seventy miles from the sea, perched in the middle of the river, on the same sticks as the Florida Cormorants, and found them more easily approached in the dusk than during broad daylight. Until then I had supposed this species to be entirely oceanic, and averse from mingling with any other.

The flight of the Cayenne Tern is strong and well sustained, although less lively or graceful than that of the smaller species, excepting on particular occasions. They usually incline their bill downwards, as they search for their prey, like the other Terns, but keep at a much greater height, and plunge towards the waters with the speed of an arrow, to seize on small fishes, of which they appear to capture a great number, especially of the "mullets," which we saw moving about in shoals, composed of individuals of different sizes. When travelling, these birds generally proceed in lines; and it requires the power of a strong gale to force them back, or even to impede their progress, for they beat to windward with remarkable vigour, rising, falling, and tacking to right and left, so as to seize every possible opportunity of making their way. In calm and pleasant weather, they pass at a great height, with strong unremitted flappings, uttering at intervals their cries, which so nearly resemble the shrieking notes of our little Parrakeet, that I have often for a moment thought I heard the latter, when in fact it was only the Tern. At times their cries resemble the syllables *kwee-reek*, repeated several times in succession, and so loudly as to be heard at the distance of half a mile or more, especially when they have been disturbed at

their breeding places, on which occasion they manifest all the characteristic violence of their tribe, although they are much more guarded than any other species with which I am acquainted, and generally keep at a considerable distance from their unwelcome visiters.

On the 11th of May, 1832, I found the Cayenne Terns breeding on one of the Tortugas. There they had dropped their eggs on the bare sand, a few yards above high-water mark, and none of the birds paid much attention to them during the heat of the day. You may judge of my surprise when, on meeting with this Tern breeding on the coast of Labrador, on the 18th of June, 1833, I found it sitting on two eggs deposited in a nest neatly formed of moss and placed on the rocks, and this on a small island, in a bay more than twelve miles from our harbour, which itself was at some distance from the open Gulf. On another equally sequestered islet, some were found amidst a number of nests of our Common Gull; and, during my stay in that country, I observed that this Tern rarely went to the vicinity of the outer coast, for the purpose of procuring food, probably because there was an extreme abundance of small fishes of several kinds in every creek or bay. Until that period I was not aware that any Tern could master the *Lestris Pomarinus*, to which, however, I there saw the Cayenne Tern give chase, driving it away from the islands on which it had its eggs. On such occasions, I observed that the Tern's power of flight greatly exceeded that of the Jager; but the appearance of the Great Black-Backed Gull never failed to fill it with dismay, for although of quicker flight, none of the Terns dared to encounter that bird, any more than they would venture to attack the Frigate Pelican in the Floridas.

The Cayenne Tern usually lays two eggs; in a few instances I found only one, and I concluded that no more had been laid, as it contained a chick, which would not have been there had the Great Gull ever visited the nest. The eggs measure two inches and six-eighths in length, by one inch and six and a half eighths in breadth, and are rather sharp at the smaller end. They have a pale yellowish ground colour, irregularly spotted with dark umber and faint purplish marks, dispersed all over but not close. The eggs, like those of the other species, afford good eating.

I never saw the young of this bird while small, and cannot speak of the changes which they undergo from their first state until autumn. Then, however, they greatly resemble the young of the Sandwich Tern, their colour being on the upper parts of a dark greyish-brown, transversely marked with umber, and on the lower dull white. While in this plumage, they keep by themselves, in flocks of fifty or more individuals, and remain separated from the old birds until spring, when they have acquired the full beauty of their plumage, although they appear rather inferior in size.

My surprise at finding this species breeding in Labrador was increased by the circumstance of its being of rare occurrence at any season along the coasts of our Middle and Eastern Districts. Nor does it become abundant until you reach the shores of North Carolina, beyond which it increases the farther south you proceed. It winters in the Floridas, and along the shores of the Mexican Gulf; but I never saw it far up the Mississippi. While on the coast of Newfoundland, on the 14th of August, I saw several individuals on their way southward, flying very high, and keeping up their remarkable cries.

The flesh of every species of Tern is oily, like that of the Gulls and Jagers, and the smallest hole made by shot affords an exit to the grease, which is apt to destroy the beauty of their elastic plumage, so that it is very difficult to preserve them, both on account of this circumstance, and of the quantity of oil that flows from their bill. In no species have I found this to be more remarkably the case than in the Cayenne Tern.

The figure of the *crab* in the plate was introduced on account of its singularly bright red colour, which, when the animal is boiled, changes to pale yellow. It is rather common along the rocky shores of some of the Florida Keys, and is excellent eating.

STERNA CAYANA, Bonap. Syn., vol. ii. p. 353.
CAYENNE TERN, Nutt. Man., vol. ii. p. 208.
CAYENNE TERN, *Sterna cayana*, Aud. Orn. Biog., vol. iii. p. 505; vol. v. p. 639.

Male, 19, 44.

From Texas, in spring, to the Floridas, where it breeds on the Tortugas. Labrador, but not observed in the intermediate parts of the Atlantic coast. Abundant. Migratory.

Adult Male in spring.

Bill longer than the head, stout, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and direct, the tip acute. Nasal groove short; nostrils basal, lateral, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight, the sides slightly convex, nearly erect, the sharp edges inflected, the tip very acute.

Head rather large, oblong; neck of moderate length and thick; body rather slender; feet short, stout. Tibia bare for a considerable space; tarsus short, roundish, covered all round with small scales; first toe very small, third longest, fourth a little shorter, the anterior connected by reticulated webs having an incurved margin; claws slightly curved, compressed, acute,

that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head, elongated behind, rather compact on the back and wings. Wings extremely long, narrow, and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondary short, rather narrow, tapering, rounded. Tail long, deeply forked, of twelve feathers, of which the outer taper to a rounded point.

Bill bright carmine, the tips paler. Iris dark brown. Feet black. The top of the head and occiput is greenish-black: the back and wings light greyish-blue; the primary quills bluish-grey on their outer webs, darker on the outer part of the inner, their inner part white, as are the ends and inner webs of the secondaries; upper tail-coverts and tail greyish-white; all the other parts are pure white.

Length to end of tail 19 inches, to end of wings 20¼; extent of wings 44; wing from flexure 15; tail 7; bill along the back 2¾, along the edge of lower mandible 1 1/12; tarsus 3 1/12; middle toe 1, its claw ½. Weight 14½ oz.

The width of the mouth is 1¼ inches; the palate flat, with two prominent papillate ridges, the anterior part with five faint elevated lines; the posterior aperture of the nares linear, 1¼ inches long, margined with papillæ. Tongue 1 inch 11 twelfths long, narrow, fleshy above, horny beneath, channelled, and tapering to a slit horny point. Œsophagus 9 inches long, at its commencement 1 inch 9 twelfths wide, presently after 1½ inches, then contracting to 1¼ inches, and within the thorax enlarging to 1½ inches. In its form and structure it is exactly similar to that of the Gulls. The stomach is of moderate size, 2 inches long, 1 inch 9 twelfths broad; its lateral muscles rather thin; the epithelium thin but very dense, longitudinally rugous, and of a bright red colour. The proventricular glands, which are very numerous and small, form a belt only 7 twelfths in breadth. The lobes of the liver are unequal, the right 2½ twelfths, the left 2¼ twelfths in length; the gall-bladder 8 twelfths long, 4½ twelfths broad. The intestine measures 34 inches in length, 6 twelfths in width at the upper part, contracting to 3 twelfths. Cœca 4¼ twelfths long, 2 twelfths wide; their distance from the extremity only 2¼ inches; rectum 4 twelfths wide, but enlarging into a globular cloaca 10 twelfths in diameter.

The trachea is 6¼ inches long, very wide at the top, where it measures 6 twelfths, gradually diminishing to 3 twelfths; its rings unossified, very feeble, contracted before and behind, in the middle being 112 in number. Bronchi large, one with 28, the other with 30 half rings. The muscles exactly as in the Gulls.

In the œsophagus, stomach, and intestine, this bird, as well as the other

Terns, is precisely similar to the smaller Gulls, as it is also in the form, structure, and muscles of the trachea. In these respects, the Terns also resemble the Shearwater. The bill of the Cayenne Tern evidently indicates an affinity to the Phaetons, and in a less degree to the Gannets, as does the head, which is very large in proportion to the bird. On the other hand, as regards the bill, the affinity is to the larger Gulls and the Shearwater. The feet resemble those of the Gulls, but are proportionally smaller, these birds being more volatorial, and the Gulls combining that character with an affinity to the *wading* birds, while the Shearwater exhibits the abbreviated feet of the purely *flying* birds in a still greater degree.

MARSH OR GULL-BILLED TERN.

STERNA ANGLICA, *Montagu.*

PLATE CCCCXXX.—MALE.

Having taken six specimens of the Marsh Tern of America to the British Museum, and minutely compared them in all their details with the specimens of the Gull-billed Tern which formed part of the collection of Colonel MONTAGU, and were procured in the south of England, I found them to agree so perfectly that no doubt remained with me of the identity of the bird loosely described by WILSON with that first distinguished by the English ornithologist.

I have shot several Marsh Terns out of the same flock, in the early part of spring, when the youngest must therefore have been nearly a year old, and found them all equally perfect and beautiful in their plumage, but differing considerably in the length of their bills, tarsi, toes, and wings, insomuch that a person bent on forming new species might easily gratify his inclination by founding "specific characters" on differences, which, however, would be merely those of males and females of different ages. With me the habits of birds, when minutely and faithfully described, go much farther to establish the identity of individuals found in the different parts of the globe, than the best and closest descriptions of prepared skins. Colonel MONTAGU informs us that the Gull-billed Tern, *Sterna anglica*, resorts by

Gull-billed Tern. Marsh Tern.

Male

Drawn from Nature by J.J. Audubon, F.R.S.F.L.S. Lith.d Printed & Col.d by J.T. Bowen, Philad.a

preference to lakes and rivers of the interior; and Mr. SELBY states, that "on the European continent it frequents the marshes and the lakes of Neusidel and Platten in Hungary." The same naturalist also says: "Upon investigating specimens from North America, I feel no hesitation in considering the *Marsh Tern* of WILSON'S North American Ornithology to be the same bird, although Mr. ORD (in his eighth volume of that work) is inclined to regard it as distinct, in consequence of some difference between the length of the bill and tarsi, as expressed in a *drawing* of *Sterna aranea* that he examined, and the proportions of those parts in the first species as given by MONTAGU and TEMMINCK."

Now, reader, allow me to lay before you an account of the habits of the Marsh Tern, a figure of an adult individual selected from among three shot within a few hours of each other, and the measurements of several recent birds. You may then judge whether or not our bird is that described by MONTAGU.

The Marsh Tern is pretty abundant about the salt-marshes of the mouths of the Mississippi in the beginning of April; and by following the shores of the Gulf of Mexico, you will find that it comes to us from beyond Texas, as many make their appearance along that coast in a straggling manner during spring, there being seldom more than half a dozen together, and generally only two. Their journeys are performed over the waters of the sea, a few hundred yards from the shore; and when in want of food, they diverge from their ordinary course, and ranging over the land satisfy their hunger, when they resume their route.

Excepting the Cayenne Tern, I know no American species that has so powerful a flight as the present. To this power is added an elegant lightness that renders it most conspicuous and pleasing during the love season. Then "the happy pair" are seen to rise in elegant circling sweeps, almost in the manner of Hawks, and only a few feet apart, until they attain a height of about two hundred yards, when they come close together, and then glide with extended pinions through the air, the male over the female, both emitting tender and plaintive notes, while they vary their evolutions at the same height for five or six minutes. After this the winged lovers separate, plunge towards the earth with wonderful rapidity, resume their ordinary notes, and seek for food in concert. The usual cry of these birds is rough, sharp, distinguishable at a considerable distance, and often repeated as if to assure each other that they are near. When an accident happens to the female during the breeding season, her mate manifests a most affectionate concern; but the female in such a case acts differently. On shooting several males on various occasions, whether they were killed outright, or fell wounded on the earth or the water, I observed that the female would only take a round as she rose

above the reach of shot, and move off at once to some considerable distance; but when the female dropped, if on the water, the male would plunge headlong toward her, and alighting by her side, would do all in his power to aid her in swimming or flying off. If she fell on the ground, he would alight there, and exhibit the same marks of anxious care, thus affording to the gunner the best possible opportunity of destroying him.

The Marsh Tern swims buoyantly but not swiftly, and when wounded does not attempt to dive, but when taken in the hand bites rather severely, though without uttering cries, in which latter respect it differs from the other species. Whilst travelling or inspecting the pools of the marshes, or the bayous intersecting them, it passes at a considerable height with quickly repeated movements of the wings, and when looking for food, it darts through the air and slides toward the waters, as if about to dive for fish. I have observed them coming over large mud-flats and marshes to bayous, apparently for the latter purpose; but I believe that these birds never immerse themselves in the water, as other Terns are wont to do; nor do I think that they procure fish, as on examining a number of individuals near the mouths of the Mississippi, in Texas, and at Great Egg Harbour, I never found any other food in their stomachs than insects of various kinds, including coleoptera, which were unknown to me. In many instances, when near the places first mentioned, my friend EDWARD HARRIS and myself saw them catching insects on wing over a small pond of almost putrid water, the surface of which was entirely covered with a thick green layer of water plants. The same manner of procuring food was observed over the dry land at Barataria, where they seized insects by diving as it were close to the ground and again rising to a considerable height. Their plunges were performed with great velocity, generally by the males and females alternately. In two or three instances, I have seen some of these birds plunge towards the water at sea, but always close on the shore, and have supposed that when insects are scarce on the land, particularly during their migration southward, they may be forced to feed upon fish; but this is merely a supposition, in support of which I have no fact to offer. I look upon what has been said as to their feeding along the sea-shores "almost exclusively on strand birds and their eggs," as ridiculous and absurd.

On the 24th of May I observed this species mastered and driven from its feeding grounds by the King-birds *Muscicapa, Tyrannus,* and the Martins, *Hirundo purpurea.* I am inclined to believe that these birds migrate in the same manner as many of our terrestrial species, that is, the females first, by themselves, and afterwards the males.

The Marsh Tern deposits its three eggs on the dried rushes found in the salt marshes at a short distance from the water, and carefully placed beyond

reach of any ordinary encroachment of the tides; for, as WILSON has truly said, this species forms no nest. The eggs differ considerably in their markings. They are generally an inch and three quarters in length, an inch and half an eighth in breadth, smooth, of a greenish or olivaceous tint, largely marked with irregular splashes of dark umber, almost black, disposed around the broadest part, leaving the apex with only a few small dots of the same colour, similar dots being as sparingly dispersed toward the smaller end, which falls off toward the extremity, and is there gently rounded. The parents sit more upon them than is usual with Terns which drop their eggs on the sands, and they do not leave their charge in cloudy weather. The young have the bill of a dull reddish orange-brown colour, the legs and feet of a less deep tint of the latter colour, which is retained by them until late in the winter, when these parts become black, and so continue for life.

The Marsh Tern does not extend its migrations eastward along our shores beyond New England; which will be understood by those who know, that in a continued direction the rocky shores afford them no place in which they could obtain food. But, from what I know of the extraordinary power of flight of this bird, I am not at all surprised at its being found in Europe, any more than I should be to find it cosmopolitan.

I here present the different measurements carefully taken from fresh birds of only four pairs, all shot in spring, and in full plumage, although of different ages. WILSON's measurements are as follows: "fourteen inches in length, and thirty-four in extent."

	M.	F.	M.	F.	M.	F.	M.	F.
Length to end of tail, .	13	14¾	14½	13½	13½	13½	14½	14
. . . . . claws, .	11	12½	12	11¼	12½	12¾	12	11
. . . . . wings, .	14¼	15	15½	14½	14½	13¼	15¾	14¾
Extent of wings, ...	33	34½	34½	33½	34	34	35¾	35
Tarsus, ...	1⅛	1¼	1	1⅛	1¼	1	1⅛	1⅛

The weight of the four male birds was 6½ oz., 5⅞, 6¾, 7⅛. The females were quite as heavy.

MARSH TERN, *Sterna aranea*, Wils. Amer. Orn., vol. viii. p. 143.
STERNA ARANEA, Bonap. Syn., p. 354.
MARSH TERN, *Sterna anglica*, Nutt. Man., vol. ii. p. 269.
MARSH or GULL-BILLED TERN, *Sterna anglica*, Aud. Orn. Biog., vol. v. p. 127.

Male, 14, 34.

Cosmopolite. In America, breeds from the mouth of the Mississippi to Connecticut. Not abundant. Migratory.

Adult Male in summer.

Bill about the length of the head, rather stout, compressed, acute. Upper

mandible with the dorsal line nearly straight to the anterior edge of the nostrils, then arcuato-declinate, the ridge rather broad and rounded at the base, narrowed toward the end; the sides sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip although narrow somewhat obtuse. Nasal groove comparatively short; nostrils basal, oblong, direct, pervious. Lower mandible with the angle very narrow and acute, extending to beyond the middle, the outline of the crura a little concave, that of the rest ascending and straight, a prominence or angle being formed at their junction as in Gulls, the sides erect and slightly convex, the edges sharp and inclinate, the tip acute, the gap line straight for half its length, then slightly arcuato-declinate.

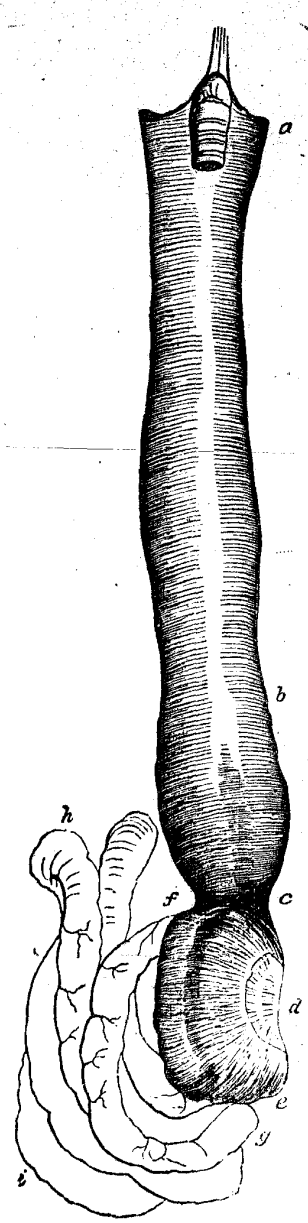
Head of moderate size, ovate; neck of moderate length; body slender. Feet small; tibia bare for nearly half an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth considerably shorter; all scutellate above, the anterior connected by reticulated webs, of which the inner is more deeply emarginate. Claws a little arched, compressed, very slender, that of the middle toe much larger, and having its inner edge somewhat dilated.

Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second ten and a half twelfths of an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely rounded, some of the inner proportionally longer and narrower. Tail of moderate length, forked, of twelve feathers, of which the middle are rounded and an inch and seven-twelfths shorter than the outer, which tapers to a narrow but obtuse point.

Bill black, as are the feet. Iris brown. The upper part of the head, the nape, and part of the hind neck, deep black; sides of the head, including a line margining the base of the upper mandible, fore neck, and all the lower parts white; upper parts pale greyish-blue; the edges of the wings whitish; the primary quills hoary on the outer web, deep grey on the inner, but with a large portion toward the base lighter, the shafts and those of the tail-feathers white; the tail is of a paler tint than the back, and the outer feather is nearly white.

Length to end of tail 14 inches; extent of wings 34; bill along the ridge $1\frac{6}{12}$, along the edge of lower mandible $2\frac{1}{12}$; wing from flexure $12\frac{1}{12}$; tail to end of middle feather $3\frac{4}{12}$, to end of lateral feather $4\frac{11}{12}$; tarsus $1\frac{4}{12}$; first toe $\frac{3}{12}$, its claw $\frac{2}{12}$; middle toe $\frac{10}{12}$, its claw $\frac{11}{12}$.

A female from the mouths of the Mississippi, April 1, 1837. On the roof of the mouth are three longitudinal ridges; the posterior aperture of the nares is linear, with an anterior slit; the tongue slender, tapering, 1 inch 2



twelfths long, papillate at the base, the outer papilla on each side larger, the tip sharp and horny. The œsophagus, *a b c*, is 5 inches long, very wide, its greatest diameter 9 twelfths. The stomach, *c d e*, is oblong, 1 inch 2 twelfths in length, 10 twelfths in breadth; its lateral muscles moderate. Its contents are coleopterous and hymenopterous insects, together with small crabs. The epithelium is thick, strong, prominently rugous, of a reddish-brown colour, and exactly resembling that of the smaller Gulls. The proventricular glandules are very small, and form a belt ½ inch in breadth. The intestine, *f g h i*, which is 1 foot 8 inches long, is wide, its average diameter being 4½ twelfths. The cœca, which come off at the distance of 2 inches from the anus, are very small, being 3 twelfths long, and 1 twelfth in diameter.

The trachea is 4 inches 2 twelfths long, at the upper part 4 twelfths in breadth, gradually contracting to 1½ twelfths. The rings, about 110, are feeble and unossified. The bronchial rings are about 20. The contractor muscle is so thin as to be scarcely perceptible; the sterno-tracheal extremely slender. There is a single pair of inferior laryngeal muscles.

The stomach of another female contains the remains of crustaceous animals, one of which, nearly entire, is a small roundish crab, 11 twelfths in breadth.

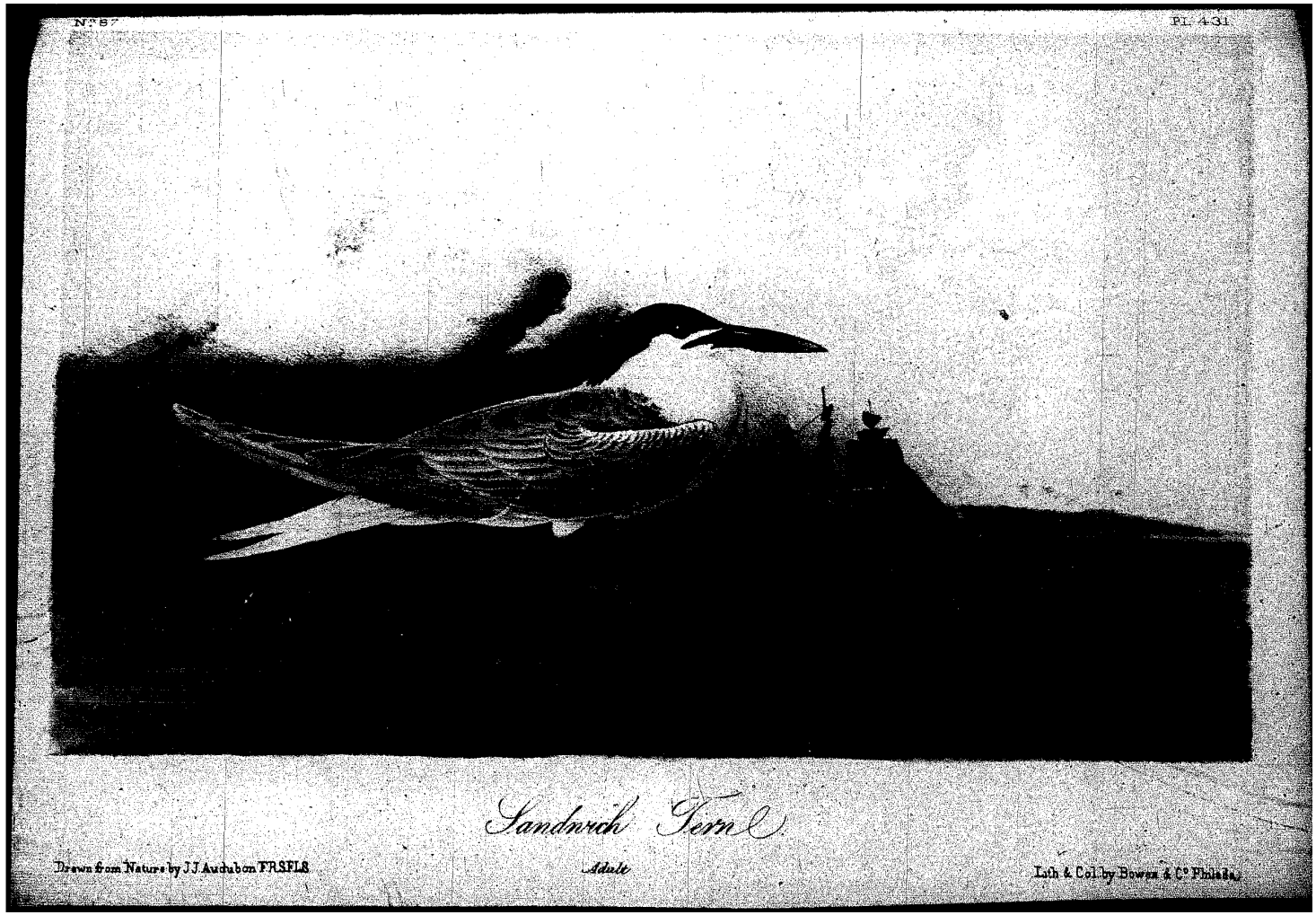
THE SANDWICH TERN.

STERNA CANTIACA, *Gmel.*

PLATE CCCCXXXI.—ADULT.

On the 26th of May, 1832, while sailing along the Florida Keys in Mr. THRUSTON'S barge, accompanied by his worthy pilot and my assistant, I observed a large flock of Terns, which, from their size and other circumstances, I would have pronounced to be Marsh Terns, had not the difference in their manner of flight convinced me that they were of a species hitherto unknown to me. The pleasure which one feels on such an occasion cannot easily be described, and all that it is necessary for me to say on the subject at present is, that I begged to be rowed to them as quickly as possible. A nod and a wink from the pilot satisfied me that no time should be lost, and in a few minutes all the guns on board were in requisition. The birds fell around us; but as those that had not been injured remained hovering over their dead and dying companions, we continued to shoot until we procured a very considerable number. On examining the first individual picked up from the water, I perceived from the yellow point of its bill that it was different from any that I had previously seen, and accordingly shouted "A prize! a prize! a new bird to the American Fauna!" And so it was, good reader, for no person before had found the Sandwich Tern on any part of our coast. A large basket was filled with them, and we pursued our course. On opening several individuals, I found in the females eggs nearly ready for being laid. The males, too, manifested the usual symptoms of increased action in the organs distinctive of the sex. I felt a great desire to discover their breeding grounds, which I had the pleasure of doing in a few days after.

The vigour and activity of this bird while on wing afforded me great pleasure. Indeed its power of flight exceeds that of the Marsh Tern, which I consider as a closely allied species. While travelling, it advances by regular sharp flappings of its wings, which propel it forward much in the manner of the Passenger Pigeon, when, single and remote from a flock, it pushes on with redoubled speed. While plunging after the small mullets and other diminutive fishes that form the principal part of its food, it darts perpendicularly downwards with all the agility and force of the Common



Sandwich Tern.

Drawn from Nature by J.J. Audubon F.R.S.F.L.S. *Adult* Lith & Col.d by Bowen & C.° Phila.a

and Arctic Terns, nearly immersing its whole body at times, but rising instantly after, and quickly regaining a position from which it can advantageously descend anew. Should the fish disappear, as the bird is descending, the latter instantly recovers itself without plunging into the water. Its cries are sharp, grating, and loud enough to be heard at the distance of half a mile. They are repeated at intervals while it is travelling, and kept up incessantly when one intrudes upon it in its breeding grounds, on which occasion it sails and dashes over your head, chiding you with angry notes more disagreeable than pleasant to your ear.

How many days these birds had been laying, when I discovered the key on which they breed, I cannot say; but many of them were still engaged in depositing their eggs, and none were as yet sitting on those which, being three together, seemed to form the full complement. They had been dropped on the sand, at short intervals, with scarcely any appearance of a hollow for their reception. In some instances they were laid at the foot of a scanty tuft of grass; but all were fully exposed to the heat of the sun, which at this time I thought almost sufficient to cook them. The eggs varied as much in colour as those of the Arctic Tern and Foolish Guillemot, and were equally disproportionate to the size of the bird, their average length being two inches and one-eighth, their greatest breadth one inch and three and a half eighths. They are of an oval form, but rather sharp at the larger end. The ground colour is yellowish-grey, varying in depth, and all more or less spotted, blotched, or marked with different tints of umber, pale blue, and reddish. I may add that these eggs are most capital eating.

I never saw the Sandwich Tern on any other portion of our coasts than between the Florida Keys and Charleston, and from whence it first came there, or how it went thence to Europe, is an enigma which may perhaps never be solved. On asking the wreckers if they had been in the habit of seeing these birds, they answered in the affirmative, and added that they paid them pretty frequent visits during the breeding season, on account of their eggs as well as of the young, which, when nearly able to fly, they said were also good eating. According to their account, this species spends the whole winter near and upon the keys, and the young keep separate from the old birds.

SANDWICH TERN, Nutt. Man., vol. ii. p. 276.
SANDWICH TERN, *Sterna cantiaca*, Aud. Orn. Biog., vol. iii. p. 531.

Adult, 15¾, 33¾.

From Texas, during spring and summer, to the Floridas, where it breeds

in great numbers. Never observed in any other part of the coast of America. Migratory.

Adult Male.

Bill longer than the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad at the base, very narrow towards the tip, the sides sloping at the base, slightly convex and nearly perpendicular towards the end, the edges sharp and inflected, the tip very acute. Nasal groove extending to a little beyond the middle of the bill and deflected towards its edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow and acute, extending nearly to the middle, the dorsal line beyond it straight, the sides convex, towards the end more erect, the ridge very narrow, the tip extremely acute.

Head of moderate size, oblong; neck of moderate length; body slender. Feet very small; tibia bare for a considerable space; tarsus very short, anteriorly scutellate, laterally and behind reticulated; toes small, slender, the first extremely small, the third longest, the fourth about the same length, the second much shorter, all scutellate above, the anterior connected by reticulated webs of which the margins are deeply concave. Claws arched, compressed, acute, that of hind toe very small, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head: the feathers on the occiput and upper part of hind neck pointed and elongated. Wings very long, narrow and pointed; primary quills tapering, the outer slightly curved inwards at the end, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded, the inner proportionally longer and narrower. Tail rather long, deeply forked, of twelve feathers, the outer tapering to a point.

Bill black, excepting the tips, which are yellow; inside of the mouth deep blue. Iris brown. Feet black. The upper part of the head, occiput and part of hind neck bluish-black. Sides of the head, neck all round, and the rest of the lower parts white, the breast frequently tinged with pink. The fore part of the back, the scapulars and the upper surface of the wings pale greyish-blue; the tips and the greater parts of the inner webs of the scapulars, and quills, white, as are the rump and the tail; the four outer quills blackish, but covered with light grey down, on the outer webs and over a considerable extent of the inner, their shafts white.

Length to end of tail 15$\frac{3}{4}$ inches, to end of wings 16 $\frac{6}{12}$; to end of claws 12$\frac{3}{4}$; extent of wings 33$\frac{2}{4}$; wing from flexure 12$\frac{1}{4}$; tail 6; bill along the back 2$\frac{1}{4}$, along the edge of lower mandible 2$\frac{2}{12}$; tarsus 1$\frac{3}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{5}{12}$. Weight 6$\frac{1}{2}$ oz.

Sooty Tern

Drawn from Nature by J.J.Audubon,FRSFLS.

Lith.Printed & Col.d by J.T.Bowen,Philad.a

The female is similar to the male.

The young, after the first moult, are of a light greyish-blue colour on the upper parts, the feathers tipped and banded in an undulating manner with brownish-black; the upper part of the head and the hind neck are of the latter colour, but mottled with white. The quills are as in the adult, the tail grey, with irregular brownish-black markings towards the tips of the feathers. The lower parts are also pale grey, but much lighter than the upper. The bill and feet are black, but the tip of the former has not yet assumed a yellow tint.

THE SOOTY TERN.

STERNA FULIGINOSA, *Lath.*

PLATE CCCCXXXII.—MALE.

Early in the afternoon of the 9th of May, 1832, I was standing on th deck of the United States revenue-cutter Marion. The weather was very beautiful, although hot, and a favourable breeze wafted us onwards in our course. Captain ROBERT DAY, who stood near me, on looking toward the south-west, ordered some person to be sent to the top to watch the appearance of land. A young lad was instantly seen ascending the rigging, and not many minutes after he had attained his post, we heard from him the cry of "land." It was the low keys of the Tortugas, toward which we had been steering. No change was made in the course of the "Lady of the Green Mantle," who glided along as if aware of the knowledge possessed by her commander. Now the light-house lantern appeared, like a bright gem, glittering in the rays of the sun. Presently the masts and flags of several wreckers shewed us that they were anchored in the small but safe harbour. We sailed on, and our active pilot, who was also the first lieutenant of the Marion, pointed out to me a small island which he said was at this season the resort of thousands of birds, which he described by calling them "Black and White Sea Swallows," and again another islet, equally well stocked with another kind of Sea Swallow, which he added were called Noddies, because they frequently alighted on the yards of vessels at night, and slept there.

He assured me that both species were on their respective breeding-grounds by millions, that the eggs of the first lay on the sand under bushes, at intervals of about a foot, while the nests of the last were placed as thickly on the bushes of their own chosen island. "Before we cast anchor," he added, "you will see them rise in swarms like those of bees when disturbed in their hive, and their cries will deafen you."

You may easily imagine how anxious I was to realize the picture; I expressed a wish to be landed on the island; but the kind officer replied, "My good sir, you will soon be tired of their incessant noise and numbers, and will enjoy the procuring of Boobies much better." After various tacks, we made our way through the curious and extremely dangerous channels leading to the small harbour, where we anchored. As the chain grated the ear, I saw a cloud-like mass arise over the "Bird Key," from which we were only a few hundred yards distant; and in a few minutes the yawl was carrying myself and my assistant ashore. On landing, I felt for a moment as if the birds would raise me from the ground, so thick were they all round, and so quick the motion of their wings. Their cries were indeed deafening, yet not more than half of them took to wing on our arrival, those which rose being chiefly male birds, as we afterwards ascertained. We ran across the naked beach, and as we entered the thick cover before us, and spread in different directions, we might at every step have caught a sitting bird, or one scrambling through the bushes to escape from us. Some of the sailors, who had more than once been there before, had provided themselves with sticks, with which they knocked down the birds as they flew thick around and over them. In less than half an hour, more than a hundred Terns lay dead in a heap, and a number of baskets were filled to the brim with eggs. We then returned on board, and declined disturbing the rest any more that night. My assistant, Mr. H. WARD, of London, skinned upwards of fifty specimens, aided by Captain DAY'S servant. The sailors told me that the birds were excellent eating, but on this point I cannot say much in corroboration of their opinion, although I can safely recommend the eggs, for I considered them delicious, in whatever way cooked, and during our stay at the Tortugas we never passed a day without providing ourselves with a good quantity of them.

The next morning Mr. WARD told me that great numbers of the Terns left their island at two o'clock, flew off towards the sea, and returned a little before day, or about four o'clock. This I afterwards observed to be regularly the case, unless there happened to blow a gale, a proof that this species sees as well during the night as by day, when they also go to sea in search of food for themselves and their young. In this respect they differ from the *Sterna stolida*, which, when overtaken at sea by darkness, even when land

is only a few miles distant, alight on the water, and frequently on the yards of vessels, where, if undisturbed, they sleep until the return of day. It is from this circumstance that they have obtained the name of Noddy, to which in fact they are much better entitled than the present species, which has also been so named, but of which I never observed any to alight on a vessel in which I was for thirty-five days in the Gulf of Mexico, at a time when that bird was as abundant during the day as the other species, of which many were caught at my desire by the sailors.

The present species rarely alights on the water, where it seems incommoded by its long tail; but the other, the *Sterna stolida*, which, in the shape of its tail, and in some of its habits, shews an affinity to the Petrels, not only frequently alights on the sea, but swims about on floating patches of the *gulf weed*, seizing on the small fry and little crabs that are found among the branches of that plant, or immediately beneath them.

I have often thought, since I became acquainted with the habits of the bird which here occupies our attention, that it differs materially from all the other species of the same genus that occur on our coasts. The *Sterna fuliginosa* never dives headlong and perpendicularly as the smaller species are wont to do, such as *St. Hirundo*, *St. arctica*, *St. minuta*, *St. Dougallii*, or *St. nigra*, but passes over its prey in a curved line, and picks it up. Its action I cannot better compare to that of any other bird than the Night Hawk, while plunging over its female. I have often observed this Tern follow and hover in the wake of a porpoise, while the latter was pursuing its prey, and at the instant when by a sudden dash it frightens and drives toward the surface the fry around it, the Tern as suddenly passes over the spot, and picks up a small fish or two.

Nor is the flight of this Tern characterized by the buoyancy and undecidedness, if I may so speak, of the other species mentioned above, it being as firm and steady as that of the Cayenne Tern, excepting during the movements performed in procuring its food. Like some of the smaller Gulls, this bird not unfrequently hovers close to the water to pick up floating objects, such as small bits of fat pork and greasy substances thrown overboard purposely for making the experiment.

There is a circumstance connected with the habits of the two species of which I now more particularly speak, which although perhaps somewhat out of place, I cannot refrain from introducing here. It is that the *Sterna stolida always forms a nest on trees or bushes*, on which that bird alights with as much ease as a Crow or Thrush; whereas the *Sterna fuliginosa* never forms a nest of any sort, but deposits its eggs in a slight cavity which it scoops in the sand under the trees. But, reader, let us return to the Bird Key.

Early the next morning I was put on shore, and remained there until I had completed my observations on the Terns. I paid no attention to their lamentable cries, which were the less piercing that on this occasion I did not molest them in the least. Having seated myself on the shelly sand, which here formed the only soil, I remained almost motionless for several hours, in consequence of which the birds alighted about me, at the distance of only a few yards, so that I could plainly see with what efforts and pains the younger females deposited their eggs. Their bill was open, and their pantings indicated their distress, but after the egg had been expelled, they immediately walked off in an awkward manner, until they reached a place where they could arise without striking the branches of the bushes near them, when they flew away. Here and there, in numerous places within twenty yards of me, females, having their complement of eggs, alighted, and quietly commenced the labour of incubation. Now and then a male bird also settled close by, and immediately disgorged a small fish within the reach of the female. After some curious reciprocal nods of their heads, which were doubtless intended as marks of affection, the caterer would fly off. Several individuals, which had not commenced laying their eggs, I saw scratch the sand with their feet, in the manner of the common fowl, while searching for food. In the course of this operation, they frequently seated themselves in the shallow basin to try how it fitted their form, or find out what was still wanted to ensure their comfort. Not the least semblance of a quarrel did I observe between any two of these interesting creatures; indeed, they all appeared as if happy members of a single family; and as if to gratify my utmost wishes, a few of them went through the process of courtship in my presence. The male birds frequently threw their heads over their back as it were, in the manner of several species of Gulls; they also swelled out their throats, walked round the females, and ended by uttering a soft puffing sound as they caressed them. Then the pair for a moment or two walked round each other, and at length rose on wing and soon disappeared. Such is one of the many sights it has been my good fortune to witness, and by each of them have I been deeply impressed with a sense of the pervading power of the Deity.

The Sooty Tern always lays three eggs as its full number, and in no instance, among thousands of the nests which were on the Bird Key, did I find one more when the female was sitting close. I was desirous of ascertaining whether the male and the female incubate alternately; but this I was unable to do, as the birds frequently left their eggs for half an hour or even three quarters at a time, but rarely longer. This circumstance, together with the very slight difference in size and colour between the sexes, was the cause of my failure.

It was curious to observe their actions whenever a large party landed on the island. All those not engaged in incubation would immediately rise in the air and scream aloud; those on the ground would then join them as quickly as they could, and the whole forming a vast mass, with a broad extended front, would as it were charge us, pass over for fifty yards or so, then suddenly wheel round, and again renew their attack. This they would repeat six or eight times in succession. When the sailors, at our desire, all shouted as loud as they could, the phalanx would for an instant become perfectly silent, as if to gather our meaning; but the next moment, like a huge wave breaking on the beach, it would rush forward with deafening noise.

When wounded and seized by the hand, this bird bites severely, and utters a plaintive cry differing from its usual note, which is loud and shrill, resembling the syllables *oo-ee, oo-ee*. Their nests are all scooped near the roots or stems of the bushes, and under the shade of their boughs, in many places within a few inches of each other. There is less difference between their eggs than is commonly seen in those of water birds, both with respect to size and colouring. They generally measure two inches and one-eighth, by one and a half, have a smooth shell, with the ground of a pale cream colour, sparingly marked with various tints of lightish umber, and still lighter marks of purple, which appear as if within the shell. The lieutenant, N. LACOSTE, Esq., informed me that shortly after the young are hatched, they ramble pell-mell over the island, to meet their parents, and be fed by them; that these birds have been known to collect there for the purpose of breeding since the oldest wreckers on that coast can recollect; and that they usually arrive in May, and remain until the beginning of August, when they retire southward to spend the winter months. I could not, however, obtain a sufficiently accurate description of the different states of plumage which they go through, so as to enable me to describe them in the manner I should wish to do. All that I can say is, that before they take their departure, the young are greyish-brown above, dull white beneath, and have the tail very short.

At Bird Key we found a party of Spanish eggers from Havana. They had already laid in a cargo of about eight tons of the eggs of this Tern and the Noddy. On asking them how many they supposed they had, they answered that they never counted them, even while selling them, but disposed of them at seventy-five cents per gallon; and that one turn to market sometimes produced upwards of two hundred dollars, while it took only a week to sail backwards and forwards to collect their cargo. Some eggers, who now and then come from Key West, sell their eggs at twelve and a half cents the

dozen; but wherever these eggs are carried, they must soon be disposed of and eaten, for they become putrid in a few weeks.

On referring to my journals once more, I find the following remarks with reference to the Sooty Tern. It would appear that at some period not very remote, the Noddy, *Sterna stolida*, must have had it in contemplation to appropriate to itself its neighbour's domains; as on examination of this island, several thousand nests of that bird were found built on the tops of the bushes, although no birds of the species were about them. It is therefore probable that if such an attempt was made by them, they were defeated and forced to confine themselves to the neighbouring island, where they breed by themselves, although it is only a few miles distant. That such interferences and conflicts now and then occur among different species of birds, has often been observed by other persons, and in several instances by myself, particularly among Herons. In these cases, right or wrong, the stronger party never fails to dislodge the weaker, and keep possession of the disputed ground.

STERNA FULIGINOSA, Bonap. Syn., p. 355.
SOOTY TERN, *Sterna fuliginosa*, Wils. Amer. Orn., vol. viii. p. 145.
SOOTY TERN, Nutt. Man., vol. ii. p. 284.
SOOTY TERN, *Sterna fuliginosa*, Aud. Orn. Biog., vol. iii. p. 263; vol. v. p. 641.

Male, 16¼, 34¾.

From Texas to the Floridas, in spring. Breeds in immense multitudes on the Tortugas. Migratory.

Adult Male.

Bill longer than the head, strong, slender, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended to beyond half the length of the bill, slightly inflected towards the edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to a little beyond the middle, the dorsal line straight, the sides convex, the sharp edges inflected, the tip very acute.

Head of moderate size, oblong, compressed; neck of moderate length; body slender; feet very small, wings and tail very long. Tibia bare for a short space; tarsus very short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticulated rather indistinct scales; toes small, slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs, having an incurved margin; claws curved, compressed,

acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondary short, broad, rather acute, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle rounded and short.

Bill and feet black. Iris chestnut. Forehead white; lores, upper part of the head, the hind neck and all the upper parts, deep black glossed with blue, excepting the edges of the wings and the lateral tail-feathers, which are white, the latter with the inner web towards the end dusky. All the lower parts and the sides of the neck are pure white.

Length to end of tail 16½ inches, to end of wings 15⅝, to end of claws 11½; extent of wings 34⅜; wing from flexure 12; tail to the end 7⅜, to the fork 3¾; bill along the ridge 1¼, along the edge of lower mandible 2$\frac{5}{12}$; tarsus $\frac{11}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{4}{12}$.

The Female is similar to the male.

Female. The mouth is formed as in the Cayenne Tern; its width 8½ twelfths. Tongue 1 inch 4 twelfths long, emarginate and papillate at the base, very slender, channelled above, horny beneath, tapering to a point. Œsophagus 6¾ inches long, 1 inch wide at the commencement, 9 twelfths along the neck, but within the thorax dilated into an enormous sac 1 inch 9 twelfths in width. Stomach exceedingly small, being only 10½ twelfths long, 7 twelfths broad; its muscles very thin, the epithelium strong, longitudinally rugous, and of a bright red colour. The belt of the proventricular glands only 3 twelfths in breadth. The walls of the œsophagus are extremely thin, so as to be membranous and transparent. Lobes of liver 1 inch 9 twelfths, and 1 inch 2 twelfths long; gall-bladder ½ inch long, 3 twelfths broad. Intestine 15 inches long, 3 twelfths broad at the commencement, diminishing to 2 twelfths; cœca 1 inch 2 twelfths long, their greatest width 1½ twelfths, at the base only ¾ twelfth; in form and proportion they are thus like those of the genus *Lestris*; their distance from the extremity 2 inches, cloaca globular, 9 twelfths in diameter.

Trachea 4 inches long, from 2½ twelfths to 1½ twelfths in breadth, roundish, the rings 95, unossified. Bronchi very wide, of 28 rings. Muscles as in the other species.

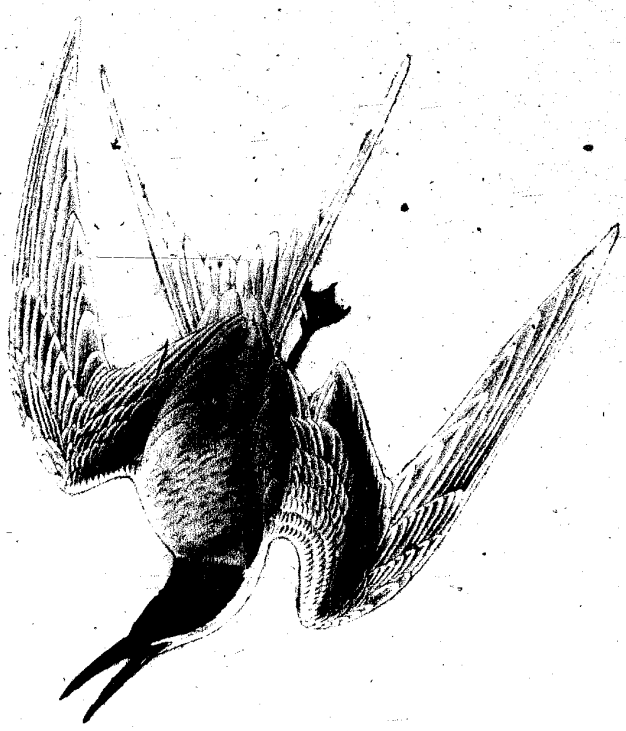
COMMON TERN.

STERNA HIRUNDO, *Linn.*

PLATE CCCCXXXIII.—ADULT MALE.

Although the Prince of MUSIGNANO has thought that the bird named the Common Tern in America differs from that bearing the same name in Europe, and has in consequence changed its appellation to that of Wilson's Tern, I am of opinion that no difference exists between the Common Terns of the two Continents. The cry of both is besides precisely similar, so that with me there is no doubt whatever as to their identity. Experience has shewn me that the markings or white spots on the primary quills of Gulls, at one time assumed as a criterion by which species might be distinguished, cannot in the least be depended on, varying, as they always do, in individuals of the same species, at almost each successive moult. Then why, reader, should not Terns exhibit analogous changes? The fact is, they do so; and it is almost impossible, on closely inspecting a dozen or more specimens procured at the same period, in either country, to find two individuals exactly corresponding in every particular. Some have the bill almost entirely black, while others have it more or less red and black, and tipped with yellow. The length of the tail-feathers, that of the tarsus, and the size of the interdigital membranes, are all found to differ in some degree, if minutely compared. If species are to be founded on such slight differences, an ample field is open to those who are ambitious of being discoverers. At all events, I cannot help remarking here that it seems to me improper to impose new names on objects, until it is proved by undeniable facts that they present permanent differences.

I have observed this species along the Atlantic coast of North America, from Galveston Island in Texas to the Straits of Belle Isle on the coast of Labrador, both in spring and in early autumn. But when on the islands in Galveston Bay, in the month of April, I saw only a few arriving there from the west; whereas, in the beginning of May great numbers arrived there from the east, settled at once, and commenced breeding. I felt convinced that the numbers which came from the direction of the Floridas were much greater than those which arrived from the westward, and judged it probable that vast numbers had at the same time left the Peninsula on their way



Common Tern

Male Spring Plumage.

northward. Should other travellers observe the same or similar phenomena at the season mentioned, it will be proved that this species does not extend its autumnal migration so far as several others, which I observed arriving at Galveston Island from the south-west, for example, the Least Tern, *Sterna minuta*, the Cayenne Tern, *St. cayana*, and the Black Tern, *St. nigra*.

The Common Tern commences breeding on the coast of our Middle Districts about the 5th of May. On my voyage to Labrador, I found its eggs on the islands in the Gulf of St. Lawrence, and especially on the Magdalene Islands, which I visited on the 11th of that month. On the 18th I saw them in great abundance in the neighbourhood of American Harbour, on the coast of Labrador, where thousands of Terns were plunging headlong after shrimps all round us. In that country, their eggs were deposited among the short grass, and the places which they occupied were but slightly scratched; whereas, on the Magdalene Islands, where they breed on sandy ridges, slight hollows were scooped out, as is generally the case along the eastern coast of the United States. Their sojourn in Labrador is of short duration; and when we were at Newfoundland, on the 14th of August, multitudes were already passing southward. At the same period considerable numbers pass by an inland route from the Canadas, and all our great lakes, travelling along the Ohio and Mississippi. While residing at Henderson, and afterwards at Cincinnati, I had ample opportunities of watching their movements in the month of September. And yet, you will think it strange, that, during their vernal migration, I never saw one ascend any of these rivers or the streams connected with them. Perhaps the inferior temperature of the waters, compared with those of the ocean, in the early spring months, may induce them to abandon their route at that season. In autumn, on the contrary, when these rivers are heated and reduced in size, the Terns may find in them an abundant supply of the fry of various fishes. It would thus appear, being corroborated by other observations which I have made relative to migration, that species whose range is extensive, are determined in their movements by a genial temperature and an abundant supply of food.

With an easy and buoyant flight, the Tern visits the whole of our indented coasts, with the intention of procuring food, or of rearing its young, amidst all the comforts and enjoyments which kind Nature has provided for it. Full of agreeable sensations, the mated pair glide along side by side, as gaily as ever glided bridegroom and bride. The air is warm, the sky of the purest azure, and in every nook the glittering fry tempts them to satiate their appetite. Here, dancing in the sunshine, with noisy mirth, the vast congregation spreads over the sandy shores, where, from immemorial time, the species has taken up its temporary abode. They all alight, and with minced steps, and tails carefully raised so as not to be injured by the sand,

the different pairs move about, renew their caresses, and scoop out a little cavity in the soil. If you come again in a few days, you will find the place covered with eggs. There they lie, three in each hollow, beautifully spotted and pointed; and as they receive heat enough from the sun, the birds have left them until evening. But not absent are they from the cherished spot, for they have seen you, and now they all fly up screaming. Although unable to drive you away, they seem most anxiously to urge your departure by every entreaty they can devise; just as you would do, were your family endangered by some creature as much stronger than yourself as you are superior to them. Humanity fills your heart, you feel for them as a parent feels, and you willingly abandon the place. The eggs are soon hatched; the young in due time follow their parents, who, not considering their pleasant labour ended when they are able to fly, feed them on wing in the manner of Swallows, until they are quite capable of procuring their subsistence themselves. So soon as this is the case, the young birds fly off in bands, to seek on distant shores, and in sunny climes, the plentiful food which the ocean yields.

The nest of the Common Tern is, as I have said, a mere hollow made in the loose sand of some island or mainland beach, scantily tufted with wiry grass, or strewed with sea-weeds. Their eggs never exceed three in number; their average length is 1 inch 5⅛ eighths, their breadth 1¼ inches. They vary greatly in their markings, as is the case with those of all the smaller species of this family; but their ground colour is generally pale yellowish-green, blotched and spotted with brownish-black and purplish-grey or neutral tint.

The young, which are fed with small fishes, shrimps, and insects, separate from the old birds when fully fledged, and do not again associate with them until the following spring, when both are found breeding in the same places. It seems quite curious to see these young birds in winter, during boisterous weather, throwing themselves into the remotest parts of estuaries, and even visiting salt-water ponds at some distance from the sea, as I have often seen them do at Charleston, in South Carolina, when accompanied by my friend the Rev. Dr. BACHMAN. Their plumage is then so very different from that of the old birds, that one might readily believe them to be of another species, did he not observe that their mode of flying and their notes are the same. Not less strange is it, that on such occasions none of the old birds are to be seen in the place, they having remained, braving the fury of the tempest, on the outer harbours. In the beginning of winter, young birds also sometimes ascend the Mississippi as far as Natchez; and in the same manner betake themselves to all the large lakes bordering the Gulf of Mexico. There, as well as elsewhere, you see them plunge into the water,

and instantaneously secure their prey, rise as quickly, and dash into another spot hard by, whenever food happens to be abundant.

I have many times seen the Common Tern suddenly fly up and come close over a man or a dog, without the least apparent provocation, indeed when far distant from its nest, and then pass and repass repeatedly within a few yards, emitting a plaintive cry, as if its eggs or young were in the immediate vicinity. At other times, when the birds were yet distant from their young, and carrying fish in their bills, they would, on seeing a man, round to, drop their food, and perform the same evolutions. I, however, know nothing more remarkable of this species of Tern, than that it should breed, as I know from personal observation to be the case, along the whole of our Atlantic coast, in suitable places, from Texas to Labrador.

When travelling in stormy weather, they skim over the surface of the water, moving rapidly and close together; whereas in fine weather, they rise high, and proceed in a straggling manner. Now and then I have seen them alight among Tringas of different species, as well as among Razor-billed Shearwaters, on outward sand beaches.

GREAT TERN, *Sterna Hirundo*, Wils. Amer. Orn., vol. viii. p. 76.
STERNA HIRUNDO, Bonap. Syn., p. 354.
STERNA HIRUNDO, *Great Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 412.
GREAT OR COMMON TERN, Nutt. Man., vol. ii. p. 271.
COMMON TERN, *Sterna Hirundo*, Aud. Orn. Biog., vol. iv. p. 74.

Male, 16, 31½.

Breeds from Galveston Island along the shores of the Atlantic to Labrador, and as far north as lat. 57°. Returns southward in autumn, passing beyond Texas. Extremely abundant.

Adult Male.

Bill about the same length as the head, rather slender, compressed, nearly straight, tapering to a narrow point. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides sloping, convex towards the end, the edges sharp and inflected, the tip very slender. Nasal groove rather long, and with a faint groove and ridge extending obliquely to the edge of the mandible; nostrils sub-basal, linear, direct, pervious. Lower mandible with the angle very narrow, extending beyond the middle, the dorsal line straight, the sides ascending and convex, the edges sharp and inflected, the tip very acute.

Head of moderate size, oblong; neck of moderate length; body very slender. Feet very small; tibia bare for a considerable space; tarsus very short, slender, compressed, covered anteriorly with twenty-two small scutella, laterally and behind with reticular scales; toes very small, slender, the first

extremely small, the third longest, the fourth considerably shorter, the second shorter than the fourth in the same proportion; the anterior toes connected by reticulated webs, which are deeply concave at their margin. Claws arched, compressed, that of the hind toe smallest, of the middle by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers, in general, broad and rounded; wings very long, narrow, and pointed; primary quills tapering to a rounded point, slightly curved inwards, the first longest, the rest rapidly graduated; secondary quills short, broad, incurved, obliquely rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill bright coral-red, black towards the end, the tip light yellow; inside of mouth reddish-orange; eye hazel. Feet coral-red, lighter than the bill; claws brownish-black. Upper part of the head, and the hind neck half-way down, deep black, the anterior part tinged with brown, the posterior with blue. The sides of the head, the fore neck, and all the lower parts, white, with a slight tinge of greyish-blue on the breast. Back, scapulars, and wings, light greyish-blue, the edges of the wings, the rump, and upper tail-coverts, white, slightly tinged with grey. First primary with the outer web deep black, the shaft white, on the inner web a greyish-black band running along the shaft, narrow at the base, and widening so as to occupy the whole breadth of the web for an inch at the end, where it is hoary. The next five have the outer web, and a varying portion of the inner, in nearly their whole length hoary, but at the same time with a dusky shade, which becomes more apparent at the ends; the rest of the quills are like the back, but margined and tipped with white. Tail-feathers with the inner webs white, the outer webs of the colour of the back, paler on the middle feathers, gradually deepening outwards, and on the outer feathers dark or blackish-grey.

Length to end of tail 16 inches, to the fork of the tail 11, to end of wings 15⅝, to end of claws 11¼; extent of wings 31½; wing from flexure 11 $\frac{3}{16}$; tail to end of lateral feathers 7 $\frac{1}{16}$, to fork 3 $\frac{1}{16}$; bare part of vibia $\frac{9}{16}$; tarsus $\frac{10}{16}$; hind toe and claw $\frac{3}{16}$, middle toe and claw 1 $\frac{1}{16}$. Weight 5 oz.

The Female is similar to the male, but rather smaller. In some instances I have seen a small portion of the forehead white.

Length to end of tail 15 inches, to the fork 11¼, to end of wings 15¼, to end of claws 11; extent of wings 30½; wing from flexure 10½. Weight 5 oz.

The Young in their first plumage have the bill dull greenish-black, with the tip yellowish; the feet greenish-yellow.

In winter, the bill is black, with the base pale orange, and the tip yellow

ish; the feet orange-yellow. The colours are as in the adult, the forehead white, the rest of the head dusky, the upper parts having the feathers slightly margined with lighter.

Length to end of tail 12¾, to the fork 11; to end of wings 14, to end of claws 10½; extent of wings 29¼; wing from flexure 8¼.

American and British specimens present no essential differences when compared in considerable numbers. The outer web of the lateral tail-feather is blackish-grey, and the inner webs of the tail-feathers are white in all the specimens collected for comparison. The tarsus in American specimens varies in length from 9 to 10½ twelfths, and the claw of the middle toe from 2½ to 4½ twelfths; but similar differences are observed in the British birds.

The tongue is 1·4 inches long, sagittate and papillate at the base, very slender, tapering, the point slit, the upper surface a little concave, the lower horny towards the end. Aperture of posterior nares linear, 9 twelfths long. Palate with a middle and two lateral ridges. Œsophagus 6 inches long, extremely wide, its average diameter on the neck 7 twelfths, within the thorax 11 twelfths. The stomach is muscular, 1 inch long, the lateral muscles not distinguishable, the fasciculi of fibres being disposed as in the rapacious birds; the central tendinous spaces 3 twelfths in diameter; the cuticular lining strong, with broad longitudinal rugæ. The contents of the stomach, fishes. The proventriculus 1 inch long. Intestine 1 foot 7 inches long, of moderate diameter, convoluted, varying from 2¾ twelfths to 2½ twelfths. Rectum 1 inch long. Cœca 5 twelfths long, with a diameter of ¾ of a twelfth.

The trachea is 3¼ inches long, 2½ twelfths in breadth above, 1½ twelfths below; its rings 103, feeble and unossified; the lateral muscles extremely slender; there are sterno-tracheal muscles, but none besides. Bronchial half-rings about 18.

HAVELL'S TERN.

STERNA HAVELLII, *Aud.*

PLATE CCCCXXXIV.—ADULT.

I have several reasons for naming this Tern after Mr. ROBERT HAVELL, of Oxford Street, London. In the first place I consider him as one of the best ornithological engravers in England. Secondly, I feel greatly indebted to him for the interest which he has always evinced in my publication, which, I dare venture to assert, is the largest work of the kind that has hitherto appeared, and the engraving of which has cost him much trouble and anxiety. Thirdly, I consider myself entitled to express my gratitude in this manner, the individual on whom I confer the honor being more deserving of it than many to whom similar compliments have been paid.

I shot several individuals of this species out of a number congregated on the broad eddies opposite New Orleans, in 1820. They were engaged in picking up floating coleopterous insects; but after I had fired several shots, and was rowing to those which had fallen on the water, the rest flew off. Since that time it had not been my fortune to meet with any birds of the same species, until I visited Texas in the spring of 1837, when two of them were procured.

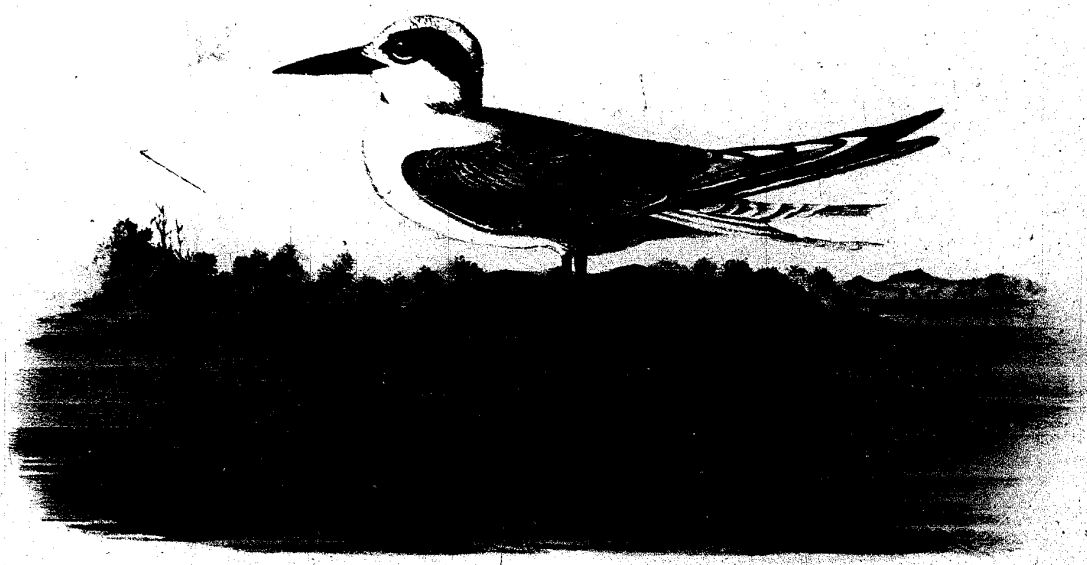
HAVELL'S TERN, *Sterna Havellii*, Aud. Orn. Biog., vol. v. p. 122.

Adult, 15½, wing, 10$\frac{3}{12}$.

From Texas to South Carolina. Common. Migratory.

Adult in winter plumage.

Bill about the length of the head, rather stout, much compressed, acute. Upper mandible with the dorsal line slightly declinato-convex, the ridge convex at the base, very narrow in the rest of its extent, the side sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip very narrow. Nasal groove rather short, but with a channel surmounted by a ridge running from its anterior part to the edge of the mandible about half an inch from the tip. Lower mandible with the angle very narrow and acute, extending to beyond the middle, the outline of the crura a little concave, that of the rest ascending and straight, a slight pro-



Havells Tern.

Adult.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S.

Lith.Printed & Col.d by J.T.Bowen, Phila.a

minence or angle being formed at their junction, as in Gulls, the sides erect and slightly convex, the edges sharp and inclinate, the tip acuminate, the gap-line slightly arcuate.

Head of moderate size, ovate; neck of moderate length: body slender. Feet small; tibia bare for seven-twelfths of an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth much longer than the second; all scutellate above, the anterior connected by reticulate webs, of which the inner is more deeply emarginate. Claws moderately arched, compressed, very slender, that of the middle toe much larger, and having its inner edge somewhat dilated.

Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second half an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely pointed, some of the inner proportionally longer and narrower. Tail of moderate length, deeply forked, of twelve feathers, of which the middle are rounded, and three inches and a quarter shorter than the outer, which taper to a slender point.

Bill black, with the base of the lower mandible tinged with brown, and a very small portion of the tip yellowish. Iris brown. Feet orange-yellow; claws dusky. Surrounding the eye, and extending toward the nape, is a broad band of black; the fore part of the head, the lower eyelid, and all the under parts are pure white; the hind parts of the head and the nape are dusky-grey, mixed with white. The rest of the upper parts are light greyish-blue, excepting the rump, which is white, the primary coverts and quills as well as the tail-feathers and their coverts are hoary, with the shafts white; but five of the quills are dusky on the outer web, on the inner along the shaft, and on the inner margin toward the end.

Length to end of tail 15½ inches; bill along the ridge $1\frac{7}{12}$, along the edge of lower mandible $2\frac{4}{12}$; wing from flexure $10\frac{8}{12}$; tail to end of middle feather $2\frac{8}{12}$, to end of longest feather $6\frac{1}{12}$; tarsus $\frac{11}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{2}{12}$; middle toe $\frac{12}{12}$, its claw $\frac{4}{12}$.

This species differs from the Marsh Tern, *Sterna anglica*, in being less robust, in having the bill a little longer and much more slender, its height at the angle being $\frac{3}{12}$, whereas in that species it is $\frac{4}{12}$; in having the tarsus shorter and much more slender, the feet yellow instead of being black, the claws more slender, and the tail more deeply forked.

The figure in the plate, which is that of an adult bird yet in its winter plumage, has the lateral tail-feathers obliquely truncate, but this was caused by accident, for these feathers in my other specimens run to a narrow point. My specimens from Texas are also in their winter plumage. One of them

is coloured as above; but the other is a young bird, which may here be described.

The bill is somewhat shorter and more tinged with brown; the lower parts, the rump, the outer web of the lateral tail-feathers and the sides of the neck are white; the wings as in the adult, but the primaries internally margined with white, and the secondaries tipped with the same; the upper part of the head, and the rest of the upper parts, are light yellowish-brown, intermixed with greyish-blue, and there is the same black band on the side of the head as in the adult.

TRUDEAU'S TERN.

STERNA TRUDEAUII, *Aud.*

PLATE CCCCXXXV.—ADULT.

This beautiful Tern, which has not hitherto been described, was procured at Great Egg Harbour in New Jersey, by my much esteemed and talented friend, J. TRUDEAU, Esq., of Louisiana, to whom I have great pleasure in dedicating it. Nothing is known as to its range, or even the particular habits in which it may differ from other species. The individual obtained was in the company of a few others of the same kind. I have received from Mr. TRUDEAU an intimation of the occurrence of several individuals on Long Island.

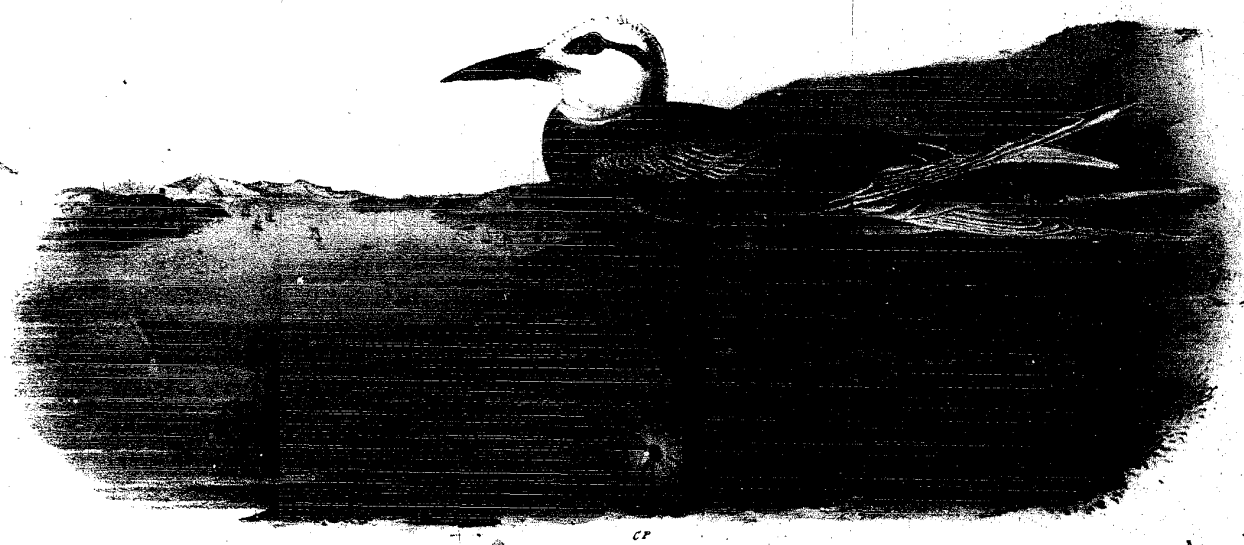
TRUDEAU'S TERN, *Sterna Trudeauii*, Aud. Orn. Biog., vol. v. p. 125.

Adult, 16; wing, $10\frac{1}{12}$.

Great Egg Harbour and Long Island. Rare. Migratory.

Adult in winter plumage.

Bill about the length of the head, rather slender, much compressed, acuminate. Upper mandible with the dorsal line slightly declinato-convex, the ridge rather broad and convex at the base, very narrow in the rest of its extent, the sides sloping at the base, nearly erect and convex toward the end, the edges sharp and inflected, the tip very narrow. Nasal groove rather short, but with a slight channel, surmounted by a ridge, running from its



Trudeau's Tern

Adult

Drawn from Nature by J.J.Audubon FRSFLS.

Lith.d Printed & Col.d by J. T. Bowen Philad.a

anterior part to the edge of the mandible about three-fourths of an inch from the tip. Lower mandible with the angle long, very narrow, and pointed, the outline of the crura a little concave, that of the rest ascending and straight, a very slight prominence or angle being formed at their junction, the sides erect and slightly convex, the edges sharp and inclinate, the tip acuminate, the gap-line slightly arcuate.

Head of moderate size, ovato-oblong, neck of moderate length; body slender. Feet small; tibia bare for half an inch; tarsus very short, compressed, anteriorly scutellate; toes small, slender; the first extremely small, the third longest, the fourth much longer than the second, all scutellate above, the anterior connected by reticulate webs, of which the inner is more deeply emarginate. Claws moderately arched compressed, very slender towards the end, that of the middle toe much larger, and having its inner edge somewhat dilated.

Plumage soft, close, blended, very short on the fore part of the head. Wings very long, narrow, and pointed; primary quills tapering to an obtuse point; the first longest, the second half an inch shorter, the rest rapidly graduated; secondaries short, incurved, obliquely pointed, some of the inner proportionally longer and narrower. Tail of moderate length, deeply forked, of twelve feathers, of which the middle are rounded, and three inches shorter than the outer, which taper to a slender point.

Bill black, with part of the base of the lower mandible, the edges of both mandibles, and their tips to the length of five-twelfths of an inch, yellow. Iris brown. Feet orange-yellow; claws dusky-yellow. Surrounding the eye, and extending toward the nape, is a band of blackish-grey; the fore part of the head, the lower eyelid, the cheeks, and the upper part of the throat, are white. The rest of the upper and lower parts are light greyish-blue, excepting the axillar feathers, the lower wing-coverts, and the rump, which are white; the tail-coverts and tail are greyish-white. The primary coverts and quills are hoary, but the outer five are dusky-grey on the inner web, toward the margin, and less so along the shaft, and on the outer web; but the shafts of all the quills and tail-feathers are white, as are the inner edges of the primaries and the tips of the secondaries, the inner excepted.

Length to end of tail 16 inches, to end of wings 15; bill along the ridge $1\frac{8}{12}$, along the edge of lower mandible $2\frac{5}{12}$; wing from flexure $10\frac{1}{12}$; tail to end of middle feather $2\frac{5}{12}$, to end of lateral feather $5\frac{8}{12}$; tarsus $1\frac{4}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{1}{12}$; middle toe $\frac{9}{12}$, its claw $\frac{1}{12}$.

This species has the bill more slender than Havell's Tern, and differently coloured, the tarsus shorter, and the lower parts of the body and neck of the same tint as the upper, whereas that species is white beneath.

It is probable that both species have the upper part of the head and the nape black in summer.

THE ARCTIC TERN.

STERNA ARCTICA, *Temm.*

PLATE CCCCXXXVI.—MALE.

Light as a sylph, the Arctic Tern dances through the air above and around you. The graces, one might imagine, had taught it to perform those beautiful gambols which you see it display the moment you approach the spot which it has chosen for its nest. Over many a league of ocean has it passed, regardless of the dangers and difficulties that might deter a more considerate traveller. Now over some solitary green isle, a creek or an extensive bay, it sweeps, now over the expanse of the boundless sea; at length it has reached the distant regions of the north, and amidst the floating icebergs stoops to pick up a shrimp. It betakes itself to the borders of a lonely sand-bank, or a low rocky island; there side by side the males and the females alight, and congratulate each other on the happy termination of their long journey. Little care is required to form a cradle for their progeny; in a short time the variegated eggs are deposited, the little Terns soon burst the shell, and in a few days hobble towards the edge of the water, as if to save their fond parents trouble; feathers now sprout on their wings, and gradually invest their whole body; the young birds at length rise on wing, and follow their friends to sea. But now the brief summer of the north is ended, dark clouds obscure the sun, a snow-storm advances from the polar lands, and before it skim the buoyant Terns, rejoicing at the prospect of returning to the southern regions.

The day after our arrival at the Magdalene Islands, the weather was beautiful, although a stiff breeze blew from the south-west. I landed with my party at an early hour, and we felt as if at a half-way house on our journey from Nova Scotia to Labrador. Some of us ascended the more elevated parts of those interesting islands, while others walked along the shores. A clean sand-beach lay before us, and we proceeded over it, until having reached a kind of peninsula, we were brought to a stand. The Piping Plover ran and flew swiftly before us, emitting its soft and mellow notes, while some dozens of Arctic Terns were plunging into the waters, capturing a tiny fish or shrimp at every dash. Until that moment this Tern had not been familiar to me, and as I admired its easy and graceful motions,

Drawn from nature by J. W. Audubon. Lith. & col. by Bowen & Co. Philad.ª

I felt agitated with a desire to possess it. Our guns were accordingly charged with mustard-seed shot, and one after another you might have seen the gentle birds come whirling down upon the waters. But previous to this I had marked their mode of flight, their manner of procuring their prey, and their notes, that I might be able to finish the picture from life. Alas, poor things! how well do I remember the pain it gave me, to be thus obliged to pass and execute sentence upon them. At that very moment I thought of those long-past times, when individuals of my own species were similarly treated; but I excused myself with the plea of necessity, as I recharged my double gun. As soon as a sufficient number of males and females lay dead at our feet, we retired from the water's edge, to watch the motions of the survivors, among whom confusion and dismay prevailed, as they dashed close over our heads, and vociferated their maledictions. We did not, however, depart until we had tried a curious experiment for the third time. A female had been shot, and lay dead on the water for a considerable while. Her mate, whom I was unwilling to destroy, alighted upon her, and attempted to caress her, as if she had been alive. The same circumstance took place three different times, on our throwing the dead bird on the water. Something of the same nature I have related in my article on the Wild Turkey. All this happened in the month of June 1833, when none of the Arctic Terns had yet produced eggs, although we found them nearly ready to lay, as were the Piping Plovers.

Our schooner now sailed onward, and carried us to the dreary shores of Labrador. There, after some search, we met with a great flock of Arctic Terns breeding on a small island slightly elevated above the sea. Myriads of these birds were there sitting on their eggs. The individuals were older than those which we had seen on the Magdalene Islands; for the more advanced in life the individuals of any species are, the more anxious are they to reproduce, the sooner do they proceed to their summer residence, and the more extensive is the range of their migration northward. On the other hand, the younger the bird is, the farther south it removes during winter, both because it thus enjoys a milder climate, and requires less exertion in procuring its food; whereas the older individuals not only have a stronger constitution, but are more expert in discovering and securing their prey, so that it is not necessary for them to extend their journey so far.

The Arctic Tern is found with us on the eastern coasts of the United States only, where it appears, from the shores of New Jersey northwards in autumn, and whence it departs in early spring. No sooner have the winter tempests subsided, than it is observed gliding along the coast, together with many other birds. In the beginning of March, you see it following the sinuosities of the shores, some passing directly from the Sable Islands

off the Bay of Fundy and Newfoundland into Baffin's Bay; others, younger, and unwilling to encounter the perils of a more extended flight, passing up the Gulf of St. Lawrence, either through the Straits of Cansso, or the broader channel between Cape Breton and Newfoundland, and betaking themselves to the Magdalene Islands and the coasts of Labrador.

While at American Harbour in June 1833, my son and some of his companions met with a low rocky island, on which hundreds of these Terns had deposited their eggs. No other species was seen there; the birds were mostly sitting, and, on the landing of the party, they all rose as if in the greatest consternation, hovered over their heads, and left their eggs to the mercy of the intruders, who carried off a basketful of them, with a few of the birds themselves.

On the 18th of the same month, the Arctic Terns were found breeding on another island in considerable numbers; many dozens of their eggs were gathered, and delicious food indeed they proved to be. The full number of their eggs is three, but as it was early in the season many had only two. Their average dimensions were an inch and a quarter in length, and five-eighths in their greatest breadth; they were oval, but rather sharp at the smaller ends; their ground-colour a light olive, irregularly covered with patches of dark umber, larger towards the round end. They were deposited on the rocks wherever there was any grass, but no nest had been formed for their reception. They differed extremely in their colour, indeed quite as much as those of the Sandwich Tern. As we approached the little island, they all rose in the air, and flew high over our heads, screaming loudly, which they continued to do until we left the place. Several were shot, and as each fell the rest immediately plunged through the air after it. Whenever one was wounded so slightly as to be able to make off, it was lost to us, and the rest followed it. Only a very few of those which we saw and shot had the bill entirely red, and those which had were evidently older birds. Some exhibited a considerable portion of the point tinged with brownish-black, yet all of them could easily be distinguished from the *Sterna Hirundo*, first by their smaller size, shorter tarsi, more delicate bill, and greater curvature of the outer part of their wings; and secondly, by the leaden tint of their lower parts, from the neck to the tail, those parts in *Sterna Hirundo* being pure white. The back is also of a deeper blue in the Arctic Tern. The long tail-feathers were much shorter in the females than in the males, but M. TEMMINCK is wrong in saying that this bird has the tail proportionally longer than that of other species, the Roseate Tern having it of much greater length, considering its diminutive size.

At the beginning of the first autumn, the plumage of the young so much resembles that of the young of *Sterna Hirundo*, that a person, not paying

attention to the tarsi and feet, might readily confound them together. Yet even at this early age, there are strong indications of the bluish tint on the under parts. The longest tail-feathers at this period do not extend more than two inches beyond the rest; the upper parts of the body are mottled with brown, as in all the other species, and in Gulls. The mantle of this, as of all other Terns, assumes its permanent hue before any part of the wings. On the 5th of August, in Labrador, the young birds were gambolling along with their parents, over the shores of Bras d'Or Harbour, and when we left that country the Terns still remained, so that I am unable to state at what particular period they commence their journey southward.

The notes of this species resemble the syllables *creek, creek*, and are often repeated while the bird is on wing. During autumn it follows the sinuosities of the shores of the bays and inlets, ascending against the ebb, and returning to meet the tide, which enables it to procure its food in succession while it keeps on its course. I have only farther to mention a curious fact, which is, that all the Terns which breed in the northern parts of the United States, and in regions still nearer the pole, sit closely on their eggs, while the small species that breed to the southward incubate only during night, or in rainy weather.

STERNA ARCTICA, Bonap. Syn., p. 354.
STERNA ARCTICA, *Arctic Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 414.
ARCTIC TERN, Nutt. Man., vol. ii. p. 275.
ARCTIC TERN, *Sterna arctica*, Aud. Orn. Biog., vol. iii. p. 366.

Male, 15½, 32.

Along the coast of the Atlantic in autumn and winter, sometimes as far as New Jersey. Common in Maine, Nova Scotia, and Labrador, where it breeds in multitudes, as well as on the Magdalene Islands, and on the shores of the Arctic Seas. Migratory.

Adult Male in spring.

Bill about the same length as the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended beyond the nostrils nearly to the tip; nostrils basal, linear, direct, previous. Lower mandible with the angle extremely narrow, very acute, extending beyond the middle, the dorsal line straight, the sides erect and slightly convex, the sharp edges inflected, the tip extremely acute.

Head of moderate size, oblong; neck of moderate length; body very slender. Feet very small; tibia bare for a considerable space; tarsus

extremely short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticular scales; toes very small, slender, the first extremely small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior connected by reticulated webs having a concave margin; claws arched, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering, slightly curved inwards, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill, mouth, and feet, vermilion tinged with carmine. Iris brown. The upper part of the head and elongated occipital feathers greenish-black; the sides of the head and chin white; the upper parts pale greyish-blue, the rump lighter, the tail white, excepting the outer webs of the two lateral feathers which are dusky-grey; primaries dusky towards the ends, the two outer with their outer webs blackish, all with the greater part of the inner web white; secondaries tipped with white. Neck, breast, and sides pale greyish-blue, like the upper parts, but lighter; abdomen, under tail-coverts, and lower surfaces of wings and tail white.

Length to end of tail 15½ inches, to end of wings 13½, to end of claws 9¾; extent of wings 32; wing from flexure 10½; tail to end of shortest feathers 3½, to end of longest 7½; bill along the ridge 1½, along the edge of lower mandible 1 1/16; tarsus 9/12; middle toe 1 1/16, its claw 1/2. Weight 2¾ oz.

Roseate Tern

THE ROSEATE TERN.

STERNA DOUGALLII, *Mont.*

PLATE CCCCXXXVII.—ADULT.

On the 28th of April, 1832, it was my lot to be on the beautiful rocky islet named Indian Key, where I spent a few hours of the night in unsuccessful attempts to procure repose, which was effectually banished by the consciousness of my being in a portion of the country not yet examined by any industrious student of nature, and in which I expected to find much that would prove interesting. The rain fell in torrents, and the rattling of the large drops on the shingles of the veranda in which my hammock had been slung, together with the chillness of the air, contributed to keep me awake. Finding it useless to remain in bed, I roused my companions; it was just four o'clock, and in a few minutes all the people in the house were up, and breakfast preparing. Before six the rain abated, and as I was determined not to lose a day, the guns were mustered, we made our way to the boats, and pushed off through a gentle shower in quest of unknown birds! In about an hour the rain ceased, the sky gradually cleared, and the sun soon dried our clothes. About this time we observed a great number of Terns on a sand bar, which we approached. The birds were not shy, so that we obtained an opportunity of firing two guns at them, when we leaped out, and on wading to the shore picked up thirty-eight Roseate Terns and several of another species.

Beautiful, indeed, are Terns of every kind, but the Roseate excels the rest, if not in form, yet in the lovely hue of its breast. I had never seen a bird of this species before, and as the unscathed hundreds arose and danced as it were in the air, I thought them the Humming-birds of the sea, so light and graceful were their movements. Now they flocked together and hovered over us, again with a sudden dash they plunged towards us in anger; even their cries of wrath sounded musical, and although I had carried destruction among them, I felt delighted. As I have just said, I had not before seen a Roseate Tern, not even the skin of one stuffed with tow; the species was not in the Synopsis of my friend BONAPARTE, and now I had my cap filled to the brim with specimens. You may rest assured that I took precious care of those which I had procured, but not another individual was robbed of life

on that excursion. The other Terns were as new to me. I observed the form of their black bill and feet, the yellow tip of the former, and wrapped them up with care, while I tried to recollect the name they bore in books. To have found hundreds of the Roseate Tern in the Floridas, while I had anxious but slender hopes of meeting it on the coast of Labrador, was to me quite astonishing. So it was, however, and I determined to ransack every key and sand-beach, to try to find its breeding-ground. Nor were my desires ungratified.

The Roseate Tern spends the breeding season along the southern shores of the Floridas in considerable numbers. At different times in the course of nearly three months which I spent among the keys, I saw flocks of twenty, thirty, or more pairs, breeding on small detached rocky islands, scantily furnished with grass, and in the company of hundreds of Sandwich Terns. The two species appeared to agree well together, and their nests were intermingled. The full number of eggs of the present species is three. They differ considerably in size and markings; their average length, however, is an inch and three quarters, their breadth an inch and one-eighth; they are of a longish oval shape, rather narrowed at the small end, of a dull buff or clay colour, sparingly sprinkled and spotted with different tints of umber and light purple. They were deposited on the bare rocks, among the roots of the grasses, and left in fair weather to the heat of the sun. Like those of the Common Tern and other species, they are delicious eating. The eggs of the Sandwich Tern were more attended to during the day, but towards night both species sat on their eggs. I did not see any of the young, but procured a good number of those of the preceding year, which kept apart from the old birds, but had in all respects the same habits.

The Roseate Tern is at all times a noisy, restless bird; and on approaching its breeding place, it incessantly emits its sharp shrill cries, resembling the syllable *crāk*. Its flight is unsteady and flickering, like that of the Arctic or Lesser Tern, but rather more buoyant and graceful. They would dash at us and be off again with astonishing quickness, making great use of their tail on such occasions. While in search of prey, they carry the bill in the manner of the Common Tern, that is perpendicularly downward, plunge like a shot, with wings nearly closed, so as to immerse part of the body, and immediately re-ascend. They were seen dipping in this manner eight or ten times in succession, and each time generally secured a small fish. Their food consisted of fishes, and a kind of small molluscous animal which floats near the surface, and bears the name of "sailor's button." They usually kept in parties of from ten to twenty, followed the shores of the sand-bars and keys, moving backwards and forwards much in the manner of the Lesser

Tern, and wherever a shoal of small fish was found, there they would hover and dash headlong at them for several minutes at a time.

The wreckers informed me that this species returns regularly to these islands each spring, about the 10th of April, and goes off southward early in September. These birds, with their favourite companions the Sandwich Terns, habitually resorted to the sand-bars each day, to rest for an hour or two. I have never seen them on any part of our middle or eastern coast, and am of opinion that they rarely proceed farther eastward than the Capes of Florida, and that they are more attached to the immediate vicinity of the shores than the larger species, which more generally fly out to some distance. The delicate and beautiful rosy tint of the breast soon fades after death. Those specimens which were not skinned immediately after being procured did not retain it for a week, and in none of them was it perceptible, without separating the feathers, at the end of a month. In winter it disappears, as well as the glossy black of the head. The length of the outer tail-feathers varies considerably; but I could perceive no decided difference of size or colour in the sexes, although I thought the females somewhat smaller than the males.

STERNA DOUGALLII, Mont. Temm.
ROSEATE TERN, Nutt. Mann., vol. ii. p. 278.
ROSEATE TERN, *Sterna Dougallii*, Aud. Orn. Biog., vol. iii. p. 296.

Male, $14\frac{0}{12}$, 30.

Florida Keys, where it is abundant, and breeds. Migratory.

Adult Male.

Bill longer than the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove short, extended to one-third of the length of the bill deflected towards the edge; nostrils basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, very acute, extending to a little beyond the middle, the dorsal line straight, the sides convex, the sharp edges inflected, the tip extremely acute.

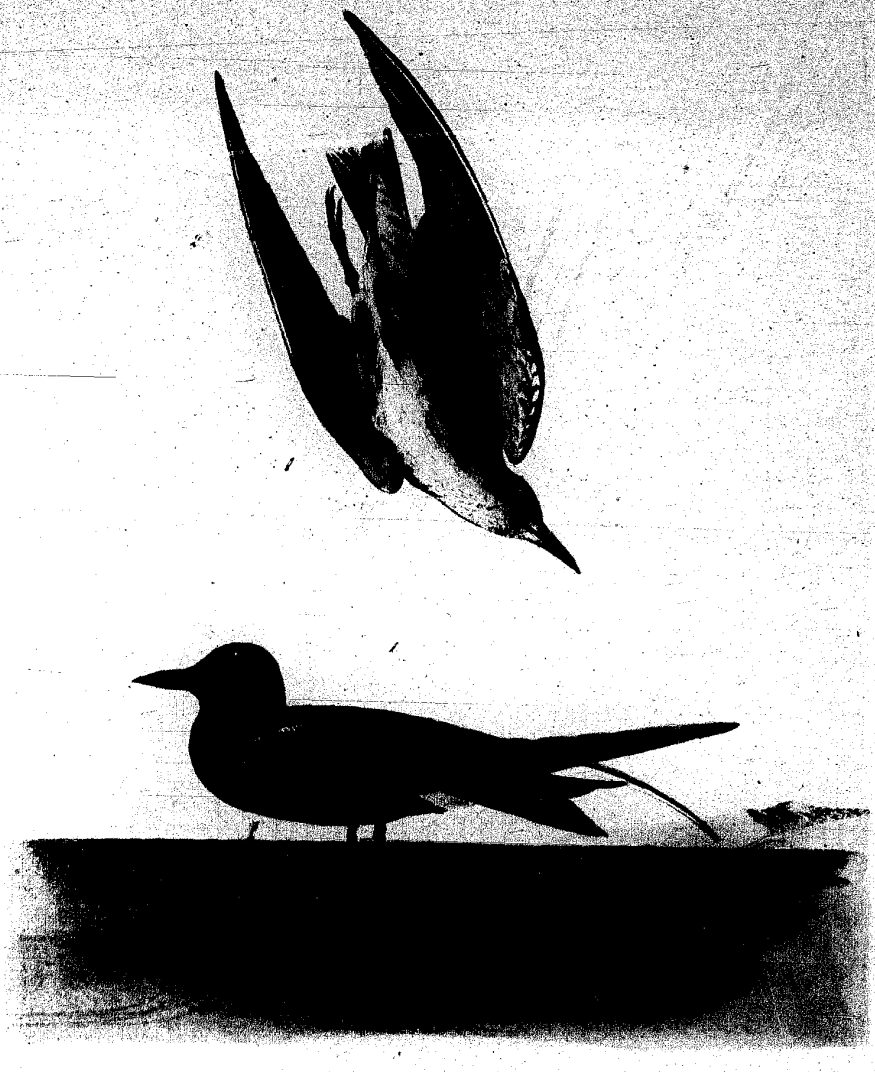
Head of moderate size, oblong; neck of moderate length; body very slender; feet small; wings and tail very long. Tibia bare for a considerable space; tarsus very short, slender, roundish, covered anteriorly with small scutella, laterally and behind with reticular scales; toes small, slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs having

a concave margin; claws curved, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded, the inner more tapering. Tail long, very deeply forked, of twelve feathers, of which the outer are tapering, the middle short and rounded.

Bill brownish-black, deep orange at the base. Iris brown. Feet vermilion; claws blackish-brown yellow at the base. The upper part of the head and elongated occipital feathers greenish-black; the hind neck white, the rest of the upper parts pale bluish-grey, the tail lighter; the edges of the wings, the tips and inner edges of the quills, and the shafts white. The first primary is black on the outer web and part of the inner, the next two are similarly marked, but with the black shaded over with pale grey, the loose barbules being of that colour; the other primaries become gradually lighter. The lower parts are of a beautiful light roseate hue, which soon fades after death; the under surface of wings and tail white.

Length to end of tail 14$\frac{8}{12}$ inches, to end of wings 12, to end of claws 9$\frac{4}{12}$; extent of wings 30; wing from flexure 9$\frac{1}{2}$; tail to end of shortest feathers 4$\frac{3}{4}$, to end of longest feathers 7$\frac{1}{2}$; bill along the ridge 1$\frac{1}{2}$, along the edge of lower mandible 2$\frac{1}{12}$; tarsus $\frac{8}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{3}{4}$.



Black Tern?

1. Adult. 2. Young.

Drawn from Nature by J.J.Audubon,F.R.S.F.L.S. Lith.Printed & Col.d by J.T.Bowen, Phila.a

THE BLACK TERN.

STERNA NIGRA, *Linn.*

PLATE CCCCXXXVIII.—ADULT MALE AND YOUNG.

The Black Tern begins to arrive from the Mexican territories over the waters of the Western Country about the middle of April, and continues to pass for about a month. At that season I have observed it ascending the Mississippi from New Orleans to the head waters of the Ohio, then cutting over the land, and arriving at the Great Lakes, beyond which many proceed still farther northward. But I have rarely met with them along our Atlantic shores until autumn, when the young, which, like those of all other Terns with which I am acquainted, mostly keep by themselves until spring, make their appearance there. Nor did I see a single individual when on my way to Labrador, or during my visit to that country. They re-appear in the Western Country, in the course of their southern migration, in the months of September and October; but many pairs breed in the intermediate range.

When residing at Louisville in Kentucky, I found the Black Tern abundant in the neighbourhood, breeding on the margins of ponds at a short distance from the Ohio. I also found them with nests and eggs on a pond near Vincennes, in the State of Indiana. Now, however, they have abandoned those places, and merely pass over the country on their way to and from the northern regions.

Often have I watched their graceful, light and rapid flight, as they advanced and passed over in groups of twenty, thirty or more, from the delightful residence of my worthy friend and kind relative NICHOLAS BERTHOUD, Esq. of Shippingport, during the month of May, when Nature, opening her stores anew, benignly smiled upon the favoured land of Kentucky. The gay birds were seen ranging from the basin at the foot of the rapids to the lower part of the narrow channel which separates Sandy Island from the shore, up the clear stream and down again, plunging at short intervals into the water to seize their prey, and continuing their pleasing occupations through the whole day. When the period of reproduction arrived, they would all betake themselves to the ponds, and search along their moist shores for tufts of rank grass such as might form suitable places for their nests. One of their favourite ponds still remains in part, although a great

portion of it has been drained. It is now known by the name of Hope-Distillery Pond, and lies a few hundred yards from the Ohio, but is nearly surrounded with buildings of various kinds. ALEXANDER WILSON, to whom I showed the old nests of the Black Tern at this place, did not seem to be acquainted with the bird, and thought that they were those of some species of Rail.

The nest is usually placed on the top of a broken tussock of the rankest grasses, of which it is itself composed, it being of a flattish form, and about two inches thick. It is enlarged or renewed every year, some nests being found to be from four to six inches in height. In some instances the water surrounds the foot of the tussock on which it is placed. They begin to lay on the first days of June. The eggs, of which the full number is four greatly resemble in colour those of the Sandwich and Arctic Terns. When disturbed at this season, these birds are as noisy as any of the tribe; but they remain close over the place, and go to the river only at intervals to procure food. Both sexes incubate by turns, and the eggs are kept constantly covered. They average in length one inch and three-eighths, by one inch across, and are nearly of an elliptical form, being but slightly pointed at one end; their ground-colour is greenish-buff, spotted and dashed with reddish umber and black, more abundantly toward the middle. I took the trouble of counting the number of nests around the pond, and found it more than seventy. About the middle of August the young fly well, and are able to seek food for themselves. I have seen the parent birds feed them on wing in the manner of swallows.

They alight less frequently on the water than the larger species. On shore they walk like Swallows. During autumn they hunt for food over the wet prairies, passing low, and picking up the insects as they proceed without alighting. At this season, both old and young have become more silent. They are at all times less shy than most others of the tribe. Their principal food consists of aquatic insects and small fry, and their flesh is tolerably good.

Since I wrote the above notice, I have been informed by my youngest son that this species was still seen about the Falls of the Ohio, in considerable numbers, a few years ago; but that, although he observed them there in spring, summer, and early autumn, he did not discover their breeding grounds, which are perhaps now farther inland than formerly.

STERNA NIGRA, Bonap. Syn., p. 355.
STERNA NIGRA, *Black Tern*, Swains. and Rich. F. Bor. Amer., vol. ii. p. 415.
BLACK TERN or STERN, Nutt. Man. vol. ii. p. 282.
BLACK TERN, *Sterna nigra*, Aud. Orn. Biog., vol. iii. p. 535; vol. v. p. 642.

Adult, 9, 24. Young, in autumn, 7¾; wing, 9$\frac{8}{12}$.

Arrives in Texas from the south early in spring, proceeds along the coast to the Mississippi, then ascends that river and its tributaries, breeding around ponds, or along the streams; and even advances to the Fur Countries, where it also breeds. Abundant. Migratory. Occasionally along the coasts of the Middle Atlantic Districts.

Adult Male.

Bill about the same length as the head, slender, tapering, compressed, nearly straight, very acute. Upper mandible with the dorsal line slightly arched, the ridge convex at the base, narrowed towards the end, the sides sloping at the base, slightly convex and nearly perpendicular towards the tip, the edges sharp, the tip acute. Nasal groove reaching nearly to the middle of the mandible; nostrils basal, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending beyond the middle, the dorsal line straight, the sides erect and slightly convex, the edges sharp and slightly inflected, the tip extremely acute.

Head of moderate size, oblong; neck rather short; body slender. Feet small; tibia bare for a short space; tarsus very short, covered anteriorly with small scutella, laterally and behind with reticular scales; toes very slender, the first extremely small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior connected by short reticulate webs, having a concave margin, and not extending much beyond the middle of the toes. Claws long, slender, arched, compressed, acute, that of hind toe smallest, of middle toe largest, and having a thin dilated inner edge.

Plumage soft, close, blended, on the head short, on the back somewhat compact. Wings very long, narrow and pointed; primary quills tapering, the outer slightly curved inwards at the end, the first longest, the rest rapidly graduated; secondary short, broad, incurved, rounded. Tail of moderate length, emarginate, of twelve rounded feathers.

Bill brownish-black. Iris brown. Feet reddish-brown, claws black. Head, neck, breast, sides, and abdomen, greyish-black; lower tail-coverts white, lower wing-coverts bluish-grey. The general colour of the upper parts is dark bluish-grey; the outer web of the first quill greyish-black.

Length to end of tail 9 inches, to end of wings 11; extent of wings 24; wing from flexure 8¾; tail 3½; bill along the back 1$\frac{1}{12}$, along the edge of lower mandible 1$\frac{5}{12}$; tarsus $\frac{6}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{4}{12}$. Weight 3 oz.

Young Male in autumn.

The bill, iris, and feet, nearly as in the adult. The upper parts are greyish-blue, the feathers of the fore part of the back, and especially the scapulars, brown towards the end; the upper and hind part of the head greyish

black, of which there is a darker mark behind, and another before the eye; the forehead greyish-white, as are the sides of the head, the fore neck, the breast, and the abdomen; the sides dusky-grey; the lower wing-coverts greyish-white. The quills are darker towards the end, and the first primary is black along the outer web.

Length to end of tail 7¾ inches, to end of wings 9$\frac{3}{12}$; wing from flexure 7¾; tail 2$\frac{9}{12}$; bill along the ridge $\frac{11}{12}$, along the edge of lower mandible 1$\frac{3}{12}$; tarsus $\frac{7}{12}$; middle toe $\frac{8}{12}$, its claw $\frac{3}{12}$.

Tongue 1 inch in length, very slender, grooved above in its whole length, tapering to a very fine horny point, which is a little slit. Œsophagus 3½ inches long, ½ inch wide, within the thorax dilated to a very large sac, 9 twelfths in breadth. Stomach of moderate size, roundish, 8 twelfths long, 7 twelfths broad; the lateral muscles moderate, the tendons large, the epithelium dense, with large longitudinal rugæ. The proventricular belt 8 twelfths in breadth. Intestine 12½ inches long, from 2 twelfths to 1 twelfth in width; cœca 1½ twelfths long, ½ twelfth wide, 1 inch 2 twelfths from the extremity; cloaca globular, 7 twelfths in width. Liver very large, the left lobe 10 twelfths long, the right 1 inch 2 twelfths. Trachea 2 inches 7 twelfths long, 2½ twelfths wide, tapering to 1 twelfth; the rings slender, unossified, 102 in number. Bronchi rather wide, of 20 half rings. Muscles as in the other Terns.

LEAST TERN.

STERNA MINUTA, *Linn.*

PLATE CCCCXXXIX.—ADULT AND YOUNG.

As no account of this species exists in the Fauna Boreali-Americana, it is to be supposed that it is not met with beyond the western shores of Labrador, where however I found it in abundance, and breeding, in the beginning of June 1833. On the 14th of August following I observed them at Newfoundland, moving southward in detached parties of old and young, against a strong breeze, and uttering their clamorous cries. Again, in the end of April 1837, hundreds of pairs were breeding on the islands of Galveston Bay in Texas, the numerous specimens which I then examined exhibiting

Least Tern.

♂ Adult in Spring ♀ Young.

Drawn from Nature by J.J.Audubon.F.R.S.F.L.S.

Lith.d Printed & Col.d by J.T.Bowen Philad.a

no difference from those obtained in Labrador and in our Middle Districts. Nay, once, in the middle of June, while wading through the quick-sands of Bayou Sara in Louisiana, I came to a high and dry sand-bar where I picked up several eggs belonging to three pairs of birds of this species, although the distance was about two hundred miles from the sea in a direct line. I have at various times observed this tern on the waters of the Ohio in autumn, and now and then in spring, at the latter period in company with the Short-tailed Tern, *Sterna nigra*, and have again met with it on the shores of Lake Erie. I have also found it in winter on the eastern coast of the Floridas, but in small numbers. Few birds indeed seem to me to be so irregular in their migratory movements, for they appear to stop at any convenient breeding place from Texas to Labrador.

Few birds are more gentle than this delicate species is at times; for, apparently unaware of danger from the vicinity of man, it allows him to approach within a few yards, whether it be on wing or on the ground. Indeed, in the latter case, I have seen it when gorged so reluctant to fly off that I have more than once thought it was asleep, although on coming up I was always disappointed in my attempts to catch it. Nothing can exceed the lightness of the flight of this bird, which seems to me to be among water fowls, the analogue of the Humming-bird. They move with great swiftness at times, at others balance themselves like hawks over their prey, then dart with the velocity of thought to procure the tiny fry beneath the surface of the waters. When you invade their breeding place, they will sometimes sweep far away, and suddenly return, coming so near as almost to strike you. While travelling, their light but firm flight is wonderfully sustained; and on hearing and seeing them on such occasions, one is tempted to believe them to be the happiest of the happy. They seem as if marshalled and proceeding to a merry-making, so gaily do they dance along, as if to the music of their own lively cries. Now you see the whole group suddenly check their onward speed, hover over a deep eddy supplied with numberless shrimps, and dash headlong on their prey. Up rises the little thing with the shrimp in its bill, and again down it plunges; and its movements are so light and graceful that you look on with pleasure, and are in no haste to depart. Should this scene be enacted while they have young in their company, the latter await in the air the rise of their parents, meet them, and receive the food from them. When all are satiated, they proceed on their journey, stopping at another similar but distant place.

Although along our Southern and Middle Districts, the Least Tern merely scoops a very slight hollow in which to deposit its eggs, doing this from the first of April to the first of June, according to the latitude of the place, those which I found breeding on the coast of Labrador had formed very snug

nests, composed of short fragments of dry moss, well matted together, and nearly of the size of that of the American Robin, *Turdus migratorius;* while those met with on the islands near the Bay of Galveston, were observed to have laid their eggs upon the dry drifted weeds which appeared to have been gathered by them for the purpose. The nests are generally placed out of reach of the tides, but on some occasions I have known the hopes of a whole colony destroyed by the sudden overflow of their selected places, caused by a severe gale, and have observed that on such occasions, their clamour was as great as if they had been robbed of their eggs by man.

The number of eggs deposited by this species is more frequently three than four. Like those of most other Terns, they differ somewhat in size and markings, although I never found any so large as those described by WILSON, who states that they measure nearly an inch and three quarters in length, which would better agree with the eggs of the Common Tern. The average of a basketful was found to be one inch and two and a half eighths in length, by seven and a half eighths in breadth. They are rather pointed at the smaller end, and their ground colour is pale yellowish-white, blotched with irregular dark brown spots, intermixed with others of a dull purplish tint.

I have found this Tern breeding among Shearwaters along the Florida coast; and my friend the Reverend JOHN BACHMAN has observed the same circumstance on the "Bird's Banks," on the coasts of South Carolina, where it is abundant, as well as on Sullivan Island.

The common note of our Least Tern resembles that of the Barn Swallow when disturbed about its nest, being as smartly and rapidly repeated at times. When it proves convenient for it to alight on the ground or on a sand-beach, after it has secured a prawn or small fish, it does so, and there devours its prey piecemeal, but it more usually swallows it on wing. On the ground it walks prettily, with short steps, keeping its tail somewhat raised.

LEAST TERN, *Sterna minuta*, Wils. Amer. Orn., vol. vii. p. 80.
STERNA MINUTA, Bonap. Syn., p. 355.
SILVERY TERN, *Sterna argentea*, Nutt. Man. vol. ii. p. 280.
LEAST TERN, *Sterna minuta*, Aud. Orn. Biog., vol. iv. p. 175.

Adult, 8¾, 18¾.

Breeds from Galveston along the shores to Labrador. Not mentioned as found in the Fur Countries. Returns southward, and passes beyond Texas in autumn. Extremely abundant at times on the Great Lakes, as well as the Ohio and Mississippi.

Adult Male.

Bill about the length of the head, slender, tapering, much compressed, nearly straight, extremely attenuated towards the end. Upper mandible with the dorsal line slightly arched, the ridge rather broad and convex at the base, narrow towards the end, the sides nearly erect, the edges sharp and direct. Nasal groove short, extending to a fourth of the length of the bill; nostrils basal, linear, direct, pervious. Lower mandible with the angle extremely narrow, very acute, extending to the middle, the dorsal line straightish, the sides erect, the edges sharp and inflected, the tip extremely acute.

Head of moderate size, ovate; neck short; body very slender; feet small. Tibia bare below; tarsus very short, slender, compressed, covered anteriorly with small scutella, laterally and behind with reticular scales; toes small, slender, the first extremely small, the third longest, the fourth considerably shorter, all scutellate above, the anterior united by reticulated webs having a deeply concave margin. Claws arched, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having its inner edge thin and dilated.

Plumage soft, close, blended, very short on the fore part of the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering, straight, the first longest, the next five-twelfths of an inch shorter, the rest rapidly graduated; secondary quills short, broad, incurved, narrowed towards the end, the inner straight. Tail rather long, very deeply forked, the lateral feathers extending an inch and seven-twelfths beyond the fork.

Bill light yellowish-orange, its tips black, but the extreme points horn-colour. Iris hazel; feet light orange-red, the bare part of the tibia dusky; claws black. On the forehead, a triangular white patch extending to the middle of the eye; upper part of the head and the nape, with a line from the eye to the bill, deep black; sides of the head, fore-neck and lower parts, pure white; back and wings very pale bluish-grey; first two quills with the outer web greyish-black, and rather less than half of their inner web of the same colour, the rest white, extending to about half an inch from their extremities. Tail white in summer, of a paler tint than the back at other times.

Length to end of tail 8¾ inches, to end of wings 9½, to end of claws 7½, to end of shortest tail-feathers 7; extent of wings 18¾; wings from flexure 6¼; tail 3½; bill along the ridge 7½ twelfths, along the edge of lower mandible $1\frac{5}{12}$; tarsus $\frac{7}{12}$; middle toe $\frac{7}{12}$, its claw $\frac{3}{12}$.

The Female is a little smaller than the male, but otherwise similar.

Young fledged.

Bill greenish-black. Iris dusky. Feet pale yellowish-orange. All the

under parts dull greyish-white, as are the upper parts, including the tail; the hind part of the head streaked with dusky; on the back and rump the feathers with a curved marginal band of greyish-brown; primary quills greyish-brown, the outer two darker. At this period the tail is even, each feather narrowly margined with greyish-white.

In a male bird the tongue is 10 twelfths long, slender, triangular, tapering to a point, horny beneath, emarginate and papillate at the base. On the palate are five longitudinal ridges. The posterior aperture of the nares is linear, 7 twelfths long. The œsophagus is 4 inches 2 twelfths long, very wide, its average diameter on the neck 4½ twelfths, within the thorax 9 twelfths; it is exceedingly thin and delicate, its muscular fibres scarcely apparent, unless closely examined. The proventriculus is only a quarter of an inch long. The stomach is 9 twelfths long, 8 twelfths broad, its lateral muscles of considerable size, the cuticular lining dense, tough, longitudinally rugous, and of a reddish-brown colour, as in Gulls. Contents of stomach and œsophagus, small fishes, one of them 2 inches long. The intestine is 14 inches long, its diameter 1½ twelfths. The cœca are 2 twelfths long nearly one twelfth in diameter.

The trachea is 2 inches and 4 twelfths long, its diameter 2 twelfths at the top, diminishing to 1 twelfth; its rings about 105, unossified; its lateral muscles moderate, as are the sterno-tracheal, and single pair of inferior laryngeal. The bronchial half-rings about 25.

THE NODDY TERN.

STERNA STOLIDA, *Linn.*

PLATE CCCCXL.—MALE.

About the beginning of May, the Noddies collect from all parts of the Gulf of Mexico, and the coasts of Florida, for the purpose of returning to their breeding places, on one of the Tortugas called Noddy Key. They nearly equal in number the Sooty Terns, which also breed on an island a few miles distant. The Noddies form regular nests of twigs and dry grass, which they place on the bushes or low trees, but never on the ground. On visiting their island on the 11th of May, 1832, I was surprised to see that

Noddy Tern.

Male

Drawn from Nature by J J Audubon FRSFLS

Lith^d Printed & Col^d by J T H

many of them were repairing and augmenting nests that had remained through the winter, while others were employed in constructing new ones, and some were already sitting on their eggs. In a great many instances, the repaired nests formed masses nearly two feet in height, and yet all of them had only a slight hollow for the eggs, broken shells of which were found among the entire ones, as if they had been purposely placed there. The birds did not discontinue their labours, although there were nine or ten of us walking among the bushes, and when we had gone a few yards into the thicket, thousands of them flew quite low over us, some at times coming so close as to enable us to catch a few of them with the hand. On one side might be seen a Noddy carrying a stick in its bill, or a bird picking up something from the ground to add to its nest; on the other several were seen sitting on their eggs unconscious of danger, while their mates brought them food. The greater part rose on wing as we advanced, but re-alighted as soon as we had passed. The bushes were rarely taller than ourselves, so that we could easily see the eggs in the nests. This was quite a new sight to me, and not less pleasing than unexpected.

The Noddy, like most other species of Terns, lays three eggs, which average two inches in length, by an inch and three-eighths in breadth, and are of a reddish-yellow colour, spotted and patched with dull red and faint purple. They afford excellent eating, and our sailors seldom failed to collect bucketsful of them daily during our stay at the Tortugas. The wreckers assured me that the young birds remain along with the old through the winter, in which respect the Noddy, if this account be correct, differs from other species, the young of which keep by themselves until spring.

At the approach of a boat, the Noddies never flew off their island, in the manner of the Sooty Terns. They appeared to go farther out to sea than those birds, in search of their food, which consists of fishes mostly caught amid the floating sea-weeds, these Terns seizing them, not by plunging perpendicularly downwards, as other species do, but by skimming close over the surface in the manner of Gulls, and also by alighting and swimming round the edges of the weeds. This I had abundant opportunities of seeing while on the Gulf of Mexico.

The flight of this bird greatly resembles that of the Night Hawk when passing over meadows or rivers. When about to alight on the water, the Noddy keeps its wings extended upwards, and touches it first with its feet. It swims with considerable buoyancy and grace, and at times immerses its head to seize on a fish. It does not see well by night, and it is perhaps for this reason that it frequently alights on the spars of vessels, where it sleeps so sound that the seamen often catch them. When seized in the hand, it utters a rough cry, not unlike that of a young American Crow taken from

the nest. On such occasions, it does not disgorge its food, like the Cayenne Tern and other species, although it bites severely, with quickly repeated movements of the bill, which, on missing the object aimed at, snaps like that of our larger Fly-catchers. Some which I kept several days, refused all kinds of food, became dull and languid, and at length died.

STERNA STOLIDA, Bonap. Syn., p. 356.
NODDY, Nutt. Man., vol. ii. p. 285.
NODDY TERN, *Sterna stolida*, Aud. Orn. Biog., vol. iii. p. 516; vol. v. p. 642.

Male, $16_{\frac{1}{2}}$, 32.

Abundant on the Gulf of Mexico during the whole year. Breeds in vast multitudes on the Tortugas Keys.

Adult Male.

Bill longer than the head, strong, slender, nearly straight, compressed, very acute. Upper mandible with the dorsal line slightly arched, the ridge broad and convex at the base, narrowed towards the end, the sides convex, the edges sharp and inflected, the tip acute. Nasal groove extended to beyond half the length of the bill, slightly deflected towards the edge; nostrils submedial, linear, direct, pervious. Lower mandible with the angle very narrow, acute, extending to the middle, the dorsal line straight or very slightly concave, the sides convex, the sharp edges inflected, the tip extremely acute.

Head of moderate size, oblong, compressed; neck of moderate length; body slender; feet very short, rather stout. Tibia bare for a short space; tarsus very short, roundish, covered anteriorly with small scutella, laterally and behind with reticulated scales; toes slender, the first very small, the third longest, the fourth nearly as long, the second much shorter, all scutellate above, the anterior united by reticulated webs, having an incurved margin; claws curved, compressed, acute, that of hind toe smallest, of middle toe by much the largest, and having the inner edge thin and dilated.

Plumage soft, close, blended, very short on the head; the feathers in general broad and rounded. Wings very long, narrow, and pointed; primary quills tapering but rounded, the first longest, the rest rapidly graduated; secondaries short, broad, rather acute, the inner more tapering. Tail long, cuneate, of twelve tapering rounded feathers.

Bill black. Iris brown. Feet dull brownish-red, the webs dusky, the claws black. The general colour is sooty brown; the primaries and tail-feathers brownish-black; the upper part of the head greyish-white; a black spot anterior to and over the eye.

Length to end of tail $16_{\frac{1}{2}}$, to end of wings $16_{\frac{1}{2}}$, to end of claws $13\frac{1}{4}$;

extent of wings 32; wing from flexure 10$\frac{9}{12}$; tail 5$\frac{3}{4}$; bill along the back 1$\frac{3}{4}$, along the edge of lower mandible 2$\frac{1}{4}$; tarsus $\frac{10}{12}$; middle toe 1$\frac{1}{2}$, its claw $\frac{4}{12}$. Weight 4$\frac{3}{4}$oz.

Width of mouth 9 twelfths. Tongue 1 inch 3 twelfths long, very slender tapering to a horny point, grooved above, emarginate and papillate at the base. Œsophagus 4 inches 4 twelfths long, its width along the neck 8 twelfths, within the thorax dilated as in the last species, its breadth 1 inch 1 twelfth: the proventricular belt 4 twelfths broad. Stomach very small, 10 twelfths long, 8 twelfths in breadth, of the same structure as in the last. Lobes of liver 1 inch 2 twelfths and 11 twelfths; gall-bladder oblong, 6 twelfths in length, 3 twelfths in breadth. Intestine 13 inches long, 2$\frac{1}{4}$ twelfths wide at the commencement, 1$\frac{1}{2}$ twelfths toward the rectum; cœca 2$\frac{1}{4}$ twelfths long, $\frac{1}{2}$ twelfth wide, 1$\frac{1}{2}$ inches from the extremity; cloaca ovate, 7 twelfths in width. Trachea 3 inches long, from 2$\frac{3}{4}$ twelfths to 1$\frac{1}{2}$ twelfths in breadth, roundish; the rings 110, very feeble. Bronchi very wide, one with 26, the other with 24 half rings.

END OF SEVENTH VOLUME.