AMERICAN SWAN.

†CYGNUS AMERICANUS, *Sharpless*.

PLATE CCCLXXXIV.—MALE.

I have never observed any Swans of this species along the Atlantic coast, or on the rivers that open upon it, beyond Cape Hatteras in North Carolina; and although they are very numerous on the waters of the Chesapeake Bay and the streams adjacent, as well as in other parts of the Middle Districts, I am yet of opinion that the great body of them spend the winter about the Columbia river, extending their autumnal migrations westward, along the shores of the Pacific Ocean, into California, and that the columns formed by these birds when about to leave their breeding grounds in high latitudes, divide into parties, of which the less numerous bands make their way from certain points as yet unknown, towards our Middle Districts, while the rest are perhaps following the valleys of the Rocky Mountains.

When travelling to a distance they proceed at a great height, with a steady and well-sustained flight, though by no means so rapid as that of the Trumpeter Swan, this difference probably arising from the greater weight and alar extent of the latter. They usually move in long lines forming the acute angle of a baseless triangle, the leader often changing his position and falling into the rear. On several occasions I have seen seven or eight leading the long single files behind them in a kind of disorderly crowded manner, which was continued until the birds were out of sight.

Not having had sufficient opportunities of studying the habits of these birds on the waters of the Chesapeake, where they are most numerous whilst in the Middle Districts, I here present you with an account of them kindly transmitted to me by Dr. SHARPLESS of Philadelphia:—

“About the first of September, the Swans leave the shores of the Polar Sea, according to FRANKLIN, and resort to the lakes and rivers in about the latitude of Hudson’s Bay (60°), where they remain preparing for a departure for the winter until October, when they collect in flocks of twenty or thirty, and seizing favourable weather, with the wind not opposed to the direction of their flight, they mount high in the air, form a prolonged wedge, and with loud screams depart for more genial climes. When making either their semi-annual migration, or on shorter expeditions, an occasional scream

Swan, Male

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

With Printed & Col'd by J. T. Bowen, Phila.

equal to 'how do you all come on behind?' issues from the leader, which is almost immediately replied to by some posterior Swan with an 'all's well' vociferation. When the leader of the party becomes fatigued with his extra duty of cutting the air, he falls in the rear, and his neighbour takes his place. When mounted, as they sometimes are, several thousand feet above the earth, with their diminished and delicate outline hardly perceptible against the clear blue of heaven, this harsh sound softened and modulated by distance, and issuing from the immense void above, assumes a supernatural character of tone and impression, that excites, the first time heard, a strangely peculiar feeling.

"In flying, these birds make a strange appearance; their long necks protrude and present, at a distance, mere lines with black points, and occupy more than one-half their whole length, their heavy bodies and triangular wings seeming but mere appendages to the prolonged point in front.

"When thus in motion, their wings pass through so few degrees of the circle, that, unless seen horizontally, they appear almost quiescent, being widely different from the heavy semicircular sweep of the Goose. The Swan, when migrating, with a moderate wind in his favour, and mounted high in the air, certainly travels at the rate of one hundred miles or more an hour. I have often *timed* the flight of the Goose, and found one mile a minute a common rapidity, and when the two birds, in a change of feeding-ground, have been flying near each other, which I have often seen, the Swan invariably passed with nearly double the velocity.

"The Swans in travelling from the northern parts of America to their winter residence, generally keep far inland, mounted above the highest peaks of the Alleghany, and rarely follow the water-courses like the Geese, which usually stop on the route, particularly if they have taken the sea-board. The Swans rarely pause on their migrating flight, unless overtaken by a storm, above the reach of which occurrence they generally soar. They have been seen following the coast in but very few instances. They arrive at their winter homes in October and November, and immediately take possession of their regular feeding-grounds. They generally reach these places in the night, and the first signal of their arrival at their winter abode is a general burst of melody, making the shores ring for several hours with their vociferating congratulations, whilst making amends for a long fast, and pluming their deranged feathers. From these localities they rarely depart unless driven farther south by intensely cold weather, until their vernal excursion. When the spring arrives, a similar collection of forces as at the north takes place in March, and, after disturbing the tranquil bosom of the water for a night, by incessant washing and dressing, and alarming the quiet

neighbourhood by a constant clatter of consulting tongues, they depart for the north about daylight with a general *feu-de-joie* of unmusical screams.

"The Chesapeake Bay is a great resort for Swans during the winter, and whilst there they form collections of from one to five hundred on the flats, near the western shores, and extend from the outlet of the Susquehanna river almost to the Rip Raps. The connecting streams also present fine feeding grounds. They always select places where they can reach their food by the length of their necks, as they have never, so far as I can learn, been seen in this part of the world to dive under the water, either for food or safety. HEARNE says, that at Hudson's Bay, "by diving and other manœuvres, it is impossible to take them by the hand while moulting." I have often seated myself for hours, within a short distance of several hundred Swans, to watch their habits and manners, and never saw one pass entirely under the water, though they will keep the head beneath the surface for five minutes at a time.

"The food they are most partial to is the canvass-back grass (*Valisneria Americana*), worms, insects, and shell-fish; never, I believe, touching fish, however hardly pressed for support. The Geese and Swans frequently feed, but never fly, together.

"These birds are so exceedingly watchful, that if there are but three of them feeding together, one will generally be on guard, and, when danger approaches, there is some mute sign of alarm, for I have never heard a sound at such times.

"However much noise has been made before, the instant an alarm occurs, there is perfect silence, their heads are erected, a moment's examination determines the course, when, if the case be not too urgent, they depend on swimming, if escape be necessary. They rarely fly even from the pursuit of a boat, unless very closely followed, and when they do arise from the water, either for escape or from choice, it is generally with a scream, and when alighting, particularly if among others, there is usually a "how d'ye do" sort of expression on all sides. Even when wing-broken, these birds can swim with great rapidity, and if not otherwise hurt, a single oarsman in the best constructed boat can rarely overtake them. A gentleman who resides on the Chesapeake near Brush river, informed me, that a few years since, he had wounded a Swan, and afterwards cured and tamed it. To prevent it from flying away, he clipped its wing, but it occasionally escaped to the water, where he had often followed it for several miles, with two rowers, before he could catch it. The unwounded birds have frequently been seen to collect around a crippled companion, and urge it to escape, pushing it forward; and I have been informed by good authorities, that they have been observed to place themselves on each side of a disabled Swan, supporting a

broken wing, and almost lifting the object of their affectionate care out of the water.

“Whilst feeding and dressing, Swans make much noise, and through the night their vociferations can be heard for several miles. Their notes are extremely varied, some closely resembling the deepest base of the common tin-horn, whilst others run through every modulation of false note of the french-horn or clarionet. Whether this difference of note depends on age or sex I am not positively assured.

“The Swan requires five or six years to reach its perfect maturity of size and plumage, the yearling Cygnet being about one-third the magnitude of the adult, and having feathers of a deep leaden colour. The smallest Swan I have ever examined, and it was killed in my presence, weighed but eight pounds. Its plumage was very deeply tinted, and it had a bill of a very beautiful *flesh*-colour, and very soft. This Cygnet, I presume, was a yearling, for I killed one myself the same day, whose feathers were less dark, but whose bill was of a dirty white; and the bird weighed twelve pounds. This happened at a time when my attention was not turned scientifically to the subject, and I have forgotten other singularities of the specimens. By the third year the bill becomes black, and the colour of the plumage less intense, except on the top of the head and back of the neck, which are the last parts forsaken by the colour. Swans of the sixth year have assumed all the characters of the adult, and very old birds have a hard protuberance on the bend of the last joint of the wing. When less than six years of age, these birds are very tender and delicious eating, having the colour and flavour of the Goose; the latter quality, however, being more concentrated and luscious. HEARNE considers a Swan, “when roasted, equal in flavour to young heifer beef, and the Cygnets are very delicate.” As these birds live to a great age, they grow more tough and dry as they advance, the *patriarchs* being as unmasticable and unsavoury as the Cygnets are tender and delightful.

“There are many modes practised in the United States of destroying these princely ornaments of the water. In shooting them whilst flying with the wind, the writer just mentioned declares, “they are the most difficult bird to kill I know, it being frequently necessary to take sight ten or twelve feet before the bill.” This I should consider an unnecessary allowance, unless driven by a hurricane, but, on ordinary occasions, the bill is aimed at, and if going with a breeze at a long shot, a foot before the bill would be quite sufficient. The covering is so extremely thick on old birds, that the largest *drop* shot will rarely kill unless the Swan is struck in the neck or under the wing, and I have often seen large masses of feathers torn from them, without for an instant impeding their progress.

"When wounded in the wing alone, a large Swan will readily beat off a dog, and is more than a match for a man in four feet water, a stroke of the wing having broken an arm, and the powerful feet almost obliterating the face of a good-sized duck-shooter. They are often killed by rifle-balls thrown from the shore into the feeding-column, and as a ball will *ricochet* on the water for several hundred yards, a wing may be disabled at the distance of half a mile.

"These birds are often brought within shooting range by sailing down upon them whilst feeding, and, as they arise against the wind, and cannot leave the water for fifteen or twenty yards, against which they strike their enormous feet and wings most furiously, great advantage is gained in distance. They must be allowed on *all* occasions to turn the side, for a breast-shot rarely succeeds in entering.

"When two feeding coves are separated by a single point, by disturbing the Swans in one or the other occasionally, they will pass and repass very closely to the projection of land, and usually taking, as they do, the straight line, each gunner, to prevent dispute, indicates the bird he will shoot at.

"In winter, boats covered by pieces of ice, the sportsman being dressed in white, are paddled or allowed to float during the night into the midst of a flock, and they have been oftentimes killed, by being knocked on the head and neck by a pole. There is, however, much danger in this mode, as others may be engaged in like manner, and shooting at a short distance, the persons might not be distinguished from the Swans. These birds seem well aware of the range of a gun, and I have followed them in a skiff for miles, driving a body of several hundreds before me, without the possibility of getting quite within shooting distance.

"The skins of Swans still covered by the down, which is very thick, are often used in our country for bonnets and tippets. The Indians also employ the skins for dresses for their women of rank, and the feathers for ornaments for the head.

"When more than one person is shooting, it is usual for each to select a particular Swan, and if there be not enough for all, two will take a particularly good bird, and, if it be killed, will decide its possession afterwards, by some *play* of chance. Few are willing to take the first bird, even though their position of *last* in the direction of flight would compel them, according to usage, to do so, not only from the difficulty and uselessness of killing the old ones, but because there is much less chance of a stray shot from a neighbour's gun assisting in the destruction.

"In the autumn of 1829, the writer, with another person, was on Abby Island, when seven Swans were approaching the point in one line, and three others a short distance behind them. The small group appeared

exceedingly anxious to pass the larger, and as they doubled the point at about sixty yards distance, the three formed with the second bird of the larger flock, a square of probably less than three feet. At this moment both guns were discharged, and three Swans were killed, and the fourth so much injured that he left the flock and reached the water a short distance in the bay; but it being nearly dark his direction was lost. These, with another that had been killed within an hour, and three which were subsequently obtained, were all of less than five years of age, and averaged a weight of eighteen pounds.

"The Swans never leave the open shores of the bay for the side streams, and the Geese rarely through the day, though they often retire to the little inlets to roost or feed at night. Few of these large game are found after their regular settlement, above Spesutie Island, but lay on the flats in mingled masses of from fifty to five hundred, down the western shores, even as far as the Potomac. During a still night, a few Swans may often be seen asleep in the middle of the bay, surrounded by a group of far more watchful Geese; and the writer has paddled at day-break one morning within ten feet of an enormous sleeping Swan, who had probably depended for alarm on the wary Geese, by which he had been surrounded, but which, as we approached, had swam away. By an unforeseen occurrence, when a few seconds would have enabled us to have stunned him by a blow, he became alarmed, and started in a direction that prevented a probable chance of killing, from our position, and the tottering nature of the skiff."

AMERICAN WILD SWAN, *Cygnus americanus*, Sharpless, Amer. Journ. of Sc. and Arts, vol. xxii.

AMERICAN SWAN, *Cygnus americanus*, Aud. Orn. Biog., vol. v. p. 133.

Male, 53, 84.

Common during winter in the Middle Atlantic Districts, especially on Chesapeake Bay. Not seen south of Carolina. Columbia river. Breeds in the Fur Countries.

Adult Male.

Bill rather longer than the head, large, higher than broad at the base, gradually becoming more depressed. Upper mandible with the dorsal line concave at the commencement, then descending and very slightly convex to beyond the nostrils, at the end decurved; the ridge broad and flat at the base, gradually narrowed, convex toward the end; the sides nearly erect and somewhat concave at the base, gradually sloping, and towards the end convex, the margins nearly parallel until toward the end, when they widen a little; the tip rather abruptly rounded, the unguis truncato-obovate. Nostril

medial, elliptical, direct, near the ridge; nasal groove elliptical. Lower mandible flattened, slightly recurved; the angle long and rather narrow, the edges parallel, the tip truncate, the unguis somewhat triangular.

Head of moderate size, oblong, compressed. Neck very long and slender. Body very large. Feet short, stout, placed a little behind the centre of the body; tibia bare for an inch and a half, and reticulated; tarsus short, moderately compressed, reticulated all round with angular scales, of which the anterior are larger; hind toe very small, scutellate above, granulate beneath; anterior toes longer than the tarsus, the outer a little shorter than the third, all reticulate above as far as the second joint, scutellate in the rest of their extent, connected by webs of which the margin is entire, the outer with a thick margin, the inner with a broader two-lobed margin. Claws of moderate size, arched, strong, rather acute, that of the middle toe with the inner edge dilated.

Plumage full, compact above, blended beneath; feathers of the head and neck softer, small, ovate, rounded. Wings ample, convex; the first quill eight-twelfths of an inch shorter than the second, which is longest, but scarcely exceeds the third; the first, second, and third cut out on the inner web. Secondaries long, broad, and rounded. Tail very short, much rounded, of twenty broad rounded feathers, of which the lateral are an inch and nine-twelfths shorter than the middle. The bill and the bare space on the fore part of the head black, with an orange oblong patch from the anterior angle of the eye; sides of lower mandible and inside of mouth yellowish flesh-colour. Iris brown; feet and claws black. The plumage is entirely pure white.

Length to end of tail 53 inches, to end of wings $50\frac{1}{2}$, to end of claws 58; extent of wings 84; bill along the ridge 4, from the tip to the eye $4\frac{8}{12}$; wing from flexure $22\frac{1}{2}$; tail $7\frac{1}{4}$; tarsus $4\frac{9}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{3}{12}$; second toe $3\frac{8}{12}$, its claw $\frac{10\frac{1}{2}}{12}$; third toe $\frac{9}{12}$, its claw $\frac{11}{12}$; fourth toe $4\frac{8}{12}$; its claw $\frac{7}{12}$. Weight $19\frac{1}{4}$ lbs. Another individual weighed only 14 lbs.

Individuals of both sexes have the upper part of the head and a portion of the neck tinged with brownish-red.

The female is somewhat smaller, but otherwise similar.

The young in its first plumage is of a uniform light bluish-grey, paler beneath, the fore and upper parts of the head tinged with red, the bill reddish flesh-colour, dusky at the point; the spaces between the eye and the bill, and between its basal angles, covered with minute feathers, which entirely disappear in the adult. The feet are dull yellowish flesh-colour.

An adult female, procured at Philadelphia. The edges of the upper mandible are soft, with about 40 transverse lamellæ, which do not project beyond the margin; those of the lower with about 60 marginal lamellæ, the

outer lamellæ only 22. Bill along the ridge $4\frac{1}{4}$ inches, from the angle of the eye to the tip $4\frac{1}{12}$; lower mandible along the edge $3\frac{1}{2}$; depth of bill at the angle of the mouth $1\frac{9}{12}$, its breadth at the nostrils $1\frac{4}{12}$, near the end $1\frac{5}{12}$. The roof of the mouth is deeply concave, with a medial prominent line, on which is a series of hard tubercles. The width of the mouth is 1 inch 5 twelfths. The eyes are very small, their diameter being 5 twelfths, the aperture of the ear 4 twelfths. The internal cells are of vast size; the right thoracic being 4 inches long, the right abdominal 6 inches, the right hepatic $5\frac{1}{2}$, the left hepatic 4, the left abdominal $3\frac{1}{4}$, the left thoracic 3. The heart is proportionally of large size, being 3 inches 2 twelfths in length, 2 inches 10 twelfths in breadth. The œsophagus, Fig. 1, *a b c*, is 2 feet 2 inches long, much narrower than the intestine, its average diameter being only 4 twelfths, but at the lower part of the neck it dilates to 8 twelfths; on entering the thorax, it passes obliquely to the left side, and the proventriculus, *b c*, has a diameter of 1 inch 2 twelfths. The inner coat of the œsophagus is thrown into strong longitudinal rugæ, and the muscular coat consists of two layers, the outer composed of longitudinal, the inner of transverse fibres. The stomach, *d e f g*, is obliquely situated on the left side, and is an extremely developed muscular gizzard, of an elliptical form, its length being 2 inches 6 twelfths, its breadth 3 inches 10 twelfths. The right lateral muscle *g*, is 1 inch 9 twelfths thick, the left *e*, 1 inch 4 twelfths. In the stomach is a large mass of very fine quartz sand, and a great number of germinating seeds of an elliptical form, some about 5 twelfths long, and of a brownish-yellow colour, together with shoots of *Salicornia*. The proventriculus is turgid with the latter. Its glands are extremely numerous, of a cylindrical form, about 3 twelfths in length. The epithelium, or inner coat of the stomach, is thick and tough, the two

Fig. 1.

Fig. 2.

grinding surfaces considerably concave, smoothish, of a horny texture, 1 inch 8 twelfths long, 1 inch 5 twelfths broad. There is a large pyloric sac, from which the duodenum, *h i j k*, comes off. It curves round the edge of the stomach to the length of $8\frac{1}{2}$ inches, as represented by Fig. 2, *a b*, forming three-fourths of a circle, and reaching the sixth rib on the left side; it then curves back upon itself, *b c*, to above the stomach, where it receives the biliary ducts, passes upwards and backwards along the spine until it nearly reaches the anus, then returns forward as far as the upper edge of the stomach, then forms a small loop 3 inches long, comes forward again, passes backward, then forward, again backward and forward, now becomes anterior,

and curves parallel to the duodenum, reaching the seventh rib, then passes backward, parallel to itself, as far as the liver, curves again in the same direction, and proceeds backward, then sweeps backward behind to near the anus, where it becomes accompanied by the cœca, comes forward on the right side to the anterior edge of the stomach, bends abruptly backwards, and terminates in the anus. It thus forms 16 curves or 8 folds. Its length is 11 feet 5 inches, its average diameter 7 twelfths. The rectum is 7 inches in length, 8 twelfths in diameter. The cœca 11 inches long, their diameter for 3 inches only 2 twelfths, in the rest of their extent from 3 to $4\frac{1}{2}$ twelfths, the extremity obtuse. The cloaca is of moderate size and of a globular form, with longitudinal rugæ on its inner surface; that of the rectum is also longitudinally rugous, and covered with flattened papillæ. The transverse muscular fibres of the intestine are all very well marked in its whole extent; the inner surface is covered with minute prominences, arranged in regular series; the anterior portion beautifully villous.

This species has 11 ribs, the anterior rib not joining the sternum. The lungs are of large size, extending from the second to the ninth rib, and having, therefore, 7 deep grooves on their upper and inner surface. The trachea is 20 inches long; its breadth at the anterior part 9 twelfths. It gradually diminishes to 7 twelfths, and is much flattened until about 6 inches

from the furcula, when it becomes gradually cylindrical, reaches the curve of the furcula, bends a little upwards, and enters a cavity formed in the sternum, along which it passes to the length of 6 inches, bends upon itself horizontally, returns, passes up between the crura of the furcula, bends backwards, and enters the thorax, its diameter in this part of its course being 7 twelfths. The inferior larynx is laterally compressed, its last rings united. Appended to the last or semilunar ring on each side is a narrow membrane, terminated by a very slender half ring; the membrane intervening between it and the first bronchial ring is large. The bronchi themselves are very short, compressed at the commencement, enlarged at the middle into a roundish cavity $7\frac{1}{2}$ twelfths in diameter, afterwards cylindrical; their entire length $1\frac{3}{4}$ inches. The lateral or contractor muscles of the trachea are large, and come off at the curve of the furcula, not following the course of the trachea within the sternum, but passing directly across to near the inferior larynx, where they terminate at the distance of $1\frac{1}{4}$ inches. The rings of the trachea are broad and well ossified; there are 148 to the curve, 40 between the lower larynx and its exit from the sternum. The right bronchus has 23, the left 21 rings.

In the external or subcutaneous cellular tissue of this bird, on the right side, over the thorax, was found a cartilaginous tumour of a roundish form, of which the greatest diameter was $1\frac{1}{4}$ inches.

GENUS IV.—ANAS, *Linn.* DUCK.

Bill about the length of the head, somewhat higher than broad at the base, depressed and widened towards the end, rounded at the tip; upper mandible with the dorsal line sloping, and a little concave, the ridge at the base broad and flat, towards the end broadly convex, as are the sides, the edges soft and rather obtuse, the marginal lamellæ numerous, oblique; unguis decurved, obovate; nasal groove elliptical, sub-basal, filled by the soft membrane of the bill; lower mandible flattened, slightly recurvate, with the angle very long and narrow, the unguis roundish, the lamellæ numerous. Nostrils sub-basal, elliptical, near the ridge. Head of moderate size, oblong, compressed; neck

Swan, Male

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