

we had a couple of miles to descend to the lake. Reaching the shore and leaving their heavy loads, the Siwash took up the trail of the deer they had started in the morning; they followed the faint trail with great skill, much like setters following a bevy of quail and with the rapidity and stealthiness of a cat. After going perhaps a mile, I was startled by seeing a big blacktail deer jump up from the tall ferns and start off on a smart trot directly away. I threw up the Winchester and blazed away. On it went, turning into some thick bushes. I fired again, much as I would at a bird, aiming about a foot in front, and was gladdened by hearing the big beast go down with a crash. With a yell of triumph we dashed after it and my big hunting knife was plunged to the hilt in its throat; and I had killed my first blacktail.

While two of the Indians skin and break up the deer, the chief and I make a fire, and he lights a cigarette. My pipe and tobacco are in my coat pocket in the boat and I long for a smoke, so I make signs to indicate that I would like a cigarette also. The big chief nods his head and grunts, which I take to mean all right, and proceeds to roll one in the most approved manner. I am rather taken aback though, when, with what he considered a great compliment, he puts it in his mouth and lights it before handing it to me. I accept with the best grace possible, and, while I enjoy the smoke, make up my mind not to ask a Siwash again for a cigarette.

It was a wild and picturesque scene; the great dark forest with its big trees, the wild, bareheaded Indians, with sleeves rolled up and long hunting knives, cutting up the deer, while the big six-foot chief, with his long black braids hanging down each side of his face, squatted complacently before the fire enjoying his smoke. There was no doubt but that I was in the West. It was late in the afternoon before we reached camp, where I received the congratulations of the party; and a good supply of fine venison was assured for some days to come.

It is impossible in a short article to describe all the incidents or give all the particulars of our three weeks' stay on this beautiful lake. I can only state in a general way that we had superb weather and an abundance of trout and venison, varied occasionally by a few ruffed and spruce grouse. We had venison three times and trout twice a day while in camp. Some sportsmen think that the blacktail are not as good eating as the whitetail deer, but we could not find much difference. I want nothing better than roast saddle of blacktail deer and currant jelly.

The Indians, of whom we had five, belonging to the Kalespell tribe, were splendid hunters though indifferent shots, and we found them in every way trustworthy, truthful and reliable. Personally I prefer them to the majority of white professional hunters. They never lied about a miss nor indulged in profanity, and never spoke unless we asked them a question. I found them perfectly honest, which is more than we could say of some of the white gold hunters who hung about our camp. I was surprised to find the Indians so clean. They used soap and water freely, and brag about their superiority in that respect to the white man. The sweat-house is quite an institution with them, and they indulge very freely in this wild substitute of the Russian bath.

The only trouble we had on the whole trip was with one of our white guides, who got drunk one night, broke into our storehouse and opened fire on us with his Winchester. The Siwash took to the woods and did not appear until the next morning. They dislike to get into a row with the whites or "Boston men" as they call them, for no matter how little they are to blame, they have to shoulder it all.

We were disappointed in one particular, we expected to find this region unvisited by white men, but the report had got abroad that there was gold in the land, and we found the country already overrun with prospectors. As these men live on the game, to say nothing of the blasting going on with giant powder, naturally the big game had left the lake shore and gone back into the mountains, making the hunting exceedingly difficult and packing the venison into camp a very serious matter. Only one of our party succeeded in killing a caribou, a fine fat cow with the horns still in the velvet. Our score for the trip was 23 blacktail and two whitetail deer and 1 caribou, besides grouse of three varieties, hares, ducks, beaver, coyotes and trout. We did not waste any game or fish; every bit killed was eaten or given away.

They call the spruce grouse fool-hens, and right well do they deserve the name, for their stupid tameness is beyond belief. The sharp-tail grouse, which they call prairie chickens, are said to be common near the beaver meadows, but we did not happen to see them. Of the famous Dolly Varden trout, which somewhat resembles our lake trout, we took very few, as they were spawning. The largest killed weighed 9 lb. We tried them with all sorts of lures, but the mottled pearl bait seemed decidedly the favorite. The black spotted trout before described would take a ything; spoons, phantom and fairy minnows, grasshopper, venison and artificial flies, nothing came amiss. I was surprised to find these fish so very shy. The water of the lake was as clear as crystal, and one could see the big fellows cruising around in schools, but at the slightest movement of the boat, or motion of the rod, they were off like a flash. As they had never been fished for, I attribute their shyness to the fish-hawk (osprey), which were daily seen fishing in the lake. They would drop into the water like a stone, often reappearing with a big trout struggling in their talons. Toward evening, just at sundown, superb sport could be had with the trout, when they came to the shallows to feed. I would let my boat drift along shore, and, when they rose with n casting distance, dropped my flies over them, and rarely failed to hook one. When fast they seemed crazy with fright and rage. As the water was too shallow for them to dive or sulk, they would tear off with the line like a race horse, making it hiss as it cut through the water, while the reel buzzed like a rattlesnake. Several times I had trout that only weighed a couple of pounds (on the scale, not estimated) run off my line until I could see the spool, and I carried 40 yds. on the reel. The rod I used on this trip was an eight-section bamboo, weighing 5oz., and about 9ft. 3in. long. So the angler can imagine the sport I had. I have killed hundreds of black bass and thousands of speckled trout on a fly-rod, but I never had fish to fight so hard or so long as these young salmon did. I suppose they could hardly be called grise.

We found the following the best flies, and the list is a good one for any locality where the black spotted trout

are found, viz.: General-Hooker, brown-hen, yellow-May, ginger-palmer, jungle-cock, jungle-Abbey, jungle-Montreal, jungle-ibis, jungle-professor, royal-coachman, great-dun, dusty-miller, beauty, grizzly-king and black-gnat. Hooks, 6 to 8 Spr.at, excepting in the small streams where a No. 10 is better. The fluttering fly, properly manipulated on the still surface of the lake, I found to be very deadly, and those that used it had a big advantage. Sometimes, in the lake, these fish would rise to a bright-colored salmon fly.

These trout had the peculiar habit of almost always taking the upper or hand fly, and if they missed it once or twice, would get very much excited and jumping clean out of water, take the fly as they went down head first. The reader can imagine what a beautiful picture this made to the angler's eye, as they showed their bright colors and glistening sides for a moment in the air. During an evening's fishing, it was indeed rare to kill a fish under 1½ lbs. and the chances were that many of them would turn the scales at 2½ lbs. and over.

A species of chub called the squaw fish was frequently caught on both fly and spoon; very good eating, though rather bony, and averaging about 2½ lbs. in weight.

We noticed the usual variety of wildfowl on the lake, but not in any great quantity. I saw no swans, and only one sandhill crane. The magpie, Idaho jay and raven were new birds to me. The pine squirrel, resembling in size and color our red squirrel, but much darker and with a tail almost black, was very common and rather a nuisance about the camp. They would climb the great pines and throw down the big solid cones by the dozen. These cones were full of nuts and weighed about a quarter of a pound each. It would have been no joke to be hit by one coming from that height. Bears we sometimes started, but owing to the dense underbrush we could not get a shot at them. Wolves, though quite common and often heard at night, are rarely seen.

Our head guide was quite a character, a New York gentleman by birth and education, who, after a romantic career, married a Kalespell squaw and settled down in Washington Territory, where he has a fine ranch and plenty of hunting.

Our return to Sand Point was better arranged than our trip out had been. We kept three or four pack horses and the cook right with us, so that at night we had our tents pitched and a comfortable time generally; besides, we were in much better trim and enjoyed roughing it.

At Sand Point we found large delegations from the Kalespell and Kootenai Indians, the latter a rich tribe from British Columbia. They were purchasing their winter supplies of flour, sugar, coffee, etc. They were a fine-looking lot of Indians, with long, black hair hanging in braids, gay-colored blankets and beads, and faces colored with vermilion, and made a lasting impression on us "Boston men." It is to be regretted that Uncle Sam does not make it more difficult for them to obtain fire-water. Their great weakness, however, is gambling. They spend days at their favorite game of "chelalak," not even stopping to sleep, and make night hideous with their monotonous tapping and howls. They stake anything and everything, even the clothing on their backs. I saw one buck in the street at Sand Point who had nothing on but an old black frock coat; a comical and startling object he was.

We tried the trout once more with good success in beautiful Pend d'Oreille, and then bade farewell to our wild tent life, reluctantly put away the comfortable garments of the woods, and returned to the stiff "boiled shirts" and hideous clothing of civilization.

W. HOLBERTON.

Natural History.

Address all communications to the Forest and Stream Pub. Co.

THE MANATEES.

By R. W. SHUFELDT, M.D., C.M.Z.S., U. S. ARMY.

Corresponding Member of the Academy of Sciences of Chicago, etc.

HAVING dealt with the Armadillos in my last contribution, they being the representatives, as we remember, of the Suborder Loricata of the Order Edentata, we now arrive in this Provisional List of the Mammals, as authoritatively arranged by the U. S. National Museum, at another very distinct order of animals, known to zoölogists as the

ORDER STRENIA. SEA-COWS.

Family TRICHECHIDÆ. The Manatees.

Trichechus manatus, Linné. South American Manatee.
Trichechus latirostris (Harlan), True. Florida Manatee.

My personal knowledge of the Manatees is principally based upon having carefully studied the skeletons and other material afforded by the Museums, and having seen a live one once on the west coast of Florida, and another, some twenty-seven or eight years ago, about half a mile up the Coatzacoalcos River on the Isthmus of Tehuantepec, southern Mexico. This last one I saw from the deck of a steamer, and I remember very well that it was in shallow water, and that I had drawn itself partly out on the muddy ooze of the bank, so that its form was very fairly exposed to my view.

Nevertheless I am quite familiar with this Order of mammals, and it will be my aim in the present article to review some of the more important parts of the history of them so far as it is at present known to naturalists.

Geology goes to show that the early Pliocene and Miocene seas of Europe swarmed with several species of animals, which zoölogists have good reason to believe were the later extinct ancestors of existing Sirenians (*Haliitherium*). But the intermediate forms which connected our living types, such as the Manatee, with the ancient ones, to which I refer, have not as yet been discovered. Zoölogists have also held, and I think it is very probable too, that the Manatees and their kind are in some way related links, remotely affined to the Cetaceans on the one hand, and the Ungulata on the other; but even of this kinship the evidence is as yet not satisfactorily demonstrated. Various other extinct sirenian species have received different names at the hands of paleontologists, but it is not our object to further pursue this part of the subject here; one form, however, recently exterminated, fully deserves a word of passing notice, and I have reference of course to the Northern Sea-cow (*Ithyina stelleri*).

Of it, Professor Flower has said, "Only one species of this genus is known, *R. stelleri*, the Northern Sea-cow, by far the largest animal of the order, attaining the length of 20 to 25ft. It was formerly an inhabitant of the shores of two small islands in the north Pacific, Behring's and the adjacent Copper Island, on the former of which it was discovered by the ill-fated navigator whose name the island bears, when, with his accomplished companion, the German naturalist Steller, he was wrecked upon it in 1741. Twenty-seven years afterward (1768), as is commonly supposed, the last of the race was killed, and its very existence would have been unknown to science but for the interesting account of its anatomy and habits left by Steller, and the few more or less perfect skeletons which have recently rewarded the researches carried on in the frozen soil of the islands around which it dwelt. There is no evidence at present of its having inhabited any other coasts than those of the islands just named, though it can hardly be supposed that its range was always so restricted. When first discovered it was extremely numerous in the shallow bays round Behring's Island, finding abundant nutriment in the large laminariae growing in the sea. Its extirpation is entirely due to the Russian hunters and traders who followed upon the tract of the explorers, and who, upon Steller's suggestion, lived upon the flesh of the great Sea-cows. Its restricted distribution, large size, inactive habits, fearlessness of man, and even its affectionate disposition toward its own kind when wounded or in distress, all contributed to accelerate its final extinction."

Professor Nordenskjöld has claimed and in the writer's opinion upon too insufficient evidence, that living specimens of this sirenian were known to exist in the locality above referred to as late as the year 1854. This matter has been more carefully examined into by Dr. Stejneger, who it would seem has very successfully refuted this erroneous notion.

We now pass to the existing types of these interesting animals, and find that there are but two genera of them, viz.: *Haliore* and *Manatus*, the first contains the famous Dugongs, sirenians very distinct in their structure from our Manatees, but as they are denizens of "the shallow bays and creeks of the Red Sea, east coast of Africa, Ceylon, islands of the bay of Bengal and the Indo-Malayan



Fig. A.—Skull of African Manatee (*Manatus senegalensis*), $\times 1.5$. (After Flower).

Fig. B.—The front view of the head of the American Manatee, showing the eyes, nostrils and mouth, and with the lobes of the upper lip divaricated.

Fig. C.—The same, with the lip contracted. (After Flower, from Murie.) These figures all copied by the present writer.

Archipelago, ranging from Barrow Reefs on the west to Moreton Bay on the east," they cannot properly claim our time and space here, as interesting as they are in many particulars. Even our own Manatee has a closely related African cousin (*M. senegalensis*), and of which form I have given a view of the skull in the present paper (A), as I had not one of the American ones at my hand.

As will be seen by the classification in my leading paragraph above, there are two species of American Manatees, but only one of these belong to our United States fauna, the Florida Manatee, a form that so far as this country is concerned, is now confined to the coasts of the peninsula from which it takes its name. Owing to the fact that most of the specimens of Manatees that have reached Europe are the South American animals, and further, as it was very natural that they should figure that form in the "Transactions," this will account for my presenting here a group of those animals in lieu of our own species; however, when reduced to this small size they would be hardly distinguishable in the drawing which illustrates the present paper.

Manatees are enabled to use the paddles formed by their forearms with considerable facility, and this is undoubtedly the way in which they originally came by their name, it being derived from the Latin word for hand. *Manatus*, moreover, is the technical name applied by some zoölogists to the genus that has been created to contain them. According to True, Mr. W. A. Conklin, director of the Central Park menagerie, in New York city, gives the following dimensions of a specimen kept alive in that establishment in 1873, these being the only reliable measurements of a Florida Manatee, under its proper name, on record: "Length, 6 ft. 9½ in.; circumference around the body, 4 ft. 9 in.; length of flipper, 1 ft.; width of same, 4½ in.; width of tail joining body, 1 ft. 6½ in.; greatest width of tail, 1 ft. 3½ in.; weight, 450 lbs." It is very likely, however, that the animal may attain to a length of at least 8 or 9 ft., as trustworthy authorities so state, in which case they would come to weigh something between five and six hundred pounds.

My figures so thoroughly portray the general form of the Manatee, that it hardly seems necessary to enter upon any very extended description in this place; we are to especially note, however, the fish-like form of the body, terminating behind in the broad, somewhat rounded and horizontal tail; the constricted neck connecting this body with a rather small, oblong head; the complete absence of hind limbs, with the fingerless paddlelike forelimbs, the latter tipped on either side with three small nails; the total absence of all fins; the wonderful minute eyes and ears, the latter being without any external pinna; the great tumid upper lips overarching rather a large mouth, the former having a sparse growth of stiff bristles growing upon them; the wrinkled skin, which is of rather a deep gray color, and having a few scattered hairs growing over it in some specimens, more especially in the younger individuals. But of all the external characters of a Manatee none are so noteworthy as the fleshy pads, one on either side, that go to form the extraordinary upper lip.

ually resort to the shallower waters of rivers, bays and lagoons, where they move sluggishly about on the bottom, browsing much in the same way that the terrestrial herbivora do upon land, their food consisting exclusively of the aquatic plants which so abundantly grow in such situations. In quiet weather, they sometimes seem to enjoy getting into deeper water, where by the assistance of their lungs, they are permitted to float at the surface, which they do arching their body in a peculiar manner. Indeed, their lungs seem to act very much in the same manner as the swim-bladder of fishes is known to operate, and while Manatees are feeding they may be seen to rise every few minutes to the surface to breathe, but instances of their getting completely out on the land remain yet to be proven, and when placed there, their acts are in the extreme most awkward. So far as their senses are concerned, these creatures have fair eyesight, acute powers of hearing, and the other powers probably well developed. They are not known to be possessed of the ability of

Industries of the United States." Mr. True in closing his article in that work, says, "In the Manatee, then, we have an animal of great size, of gentle disposition and apparently of rapid growth, which lives in places readily accessible to man, and is easily captured, and which furnishes meat which is not inferior, oil which is remarkably fine, and leather which possesses great toughness. From these considerations it would seem evident that, with the proper protection, it would furnish no small revenue to the people in those portions of our country which it inhabits, for centuries to come." (p. 128).

Finally, to those interested in the progress of science in Florida, I should say that we have not as yet by any means a complete history of this animal, and accurate reports upon the following subjects are very much to be desired: (1), an accurate observation giving all the circumstances of a Manatee voluntarily coming ashore to feed or for any other purpose; (2), the manner of coition, the period of gestation, the mode of delivery, the number of



GROUP OF SOUTH AMERICAN MANATEES.

Adapted from a drawing by Henry W. Elliott from the "Transactions of the Zoölogical Society of London," by Dr. R. W. Shufeldt, U. S. Army.

Professor Garrod in alluding to these says of them that, "These pads have the power of transversely approaching towards and receding from one another simultaneously (see figs. B & C). When the animal is on the point of seizing (say) a leaf of lettuce, the pads are diverged transversely in such a way as to make a median gap of considerable breadth. Directly the leaf is within the grasp the lip-pads are approximated, the leaf is firmly seized between their contiguous bristly surfaces, and then drawn inward by a backward movement of the lower margin of the lip as a whole."

It is said that Manatees have the power of carrying their young about within the grasp of their forelimb or limbs, and that their appearance at these times has given rise to the fabulous mermaid of nursery tale renown, but so far as the writer is concerned, if these mythical maids of the sea, which so often filled my dream-head in boyish days, or my fanciful reveries of perhaps riper years, bore any resemblance to the beauty that sits up on the tip of her tail in the group herewith presented, I beg to be excused an introduction, and, well, perish the thought in a mind thus so rudely disappointed, I fain would remark, "Not for Joseph." Certain it is, however, that these animals can make considerable use of these paddles of theirs, for with them they assist in tucking their food into their mouths, and in moving about on the bottom of the river or lagoon where they may be feeding, they use them in conjunction with the tail, in assisting their locomotory acts.

Manatees avoid getting into the open sea, but habit-

emitting any voice-sound. They seem to bear captivity well, and living specimens have been studied with great interest and advantage at the Zoölogical Gardens of London, where they have been successively kept. In behavior, they always seem to be gentle and inoffensive, exhibiting on all occasions great concern and affection for their young. Indeed, man has proven to be their greatest enemy, and they are forever pursued and captured for their flesh and skin and the oil which they yield. Thus it is that Manatees are on the road to extinction, which, everything considered, in time is sure to come about. The methods of capturing the Manatee are many; (1) they may be shot as they rise to the surface to breathe, an operation that requires great skill and quickness; (2) they are taken in some localities by means of an ingenious kind of net; (3) finally, they are captured by the various modes of spearing and the use of the harpoon.

So far as the breeding habits of the Manatee is concerned, but little or nothing is known; the best authorities have it that the period of gestation lasts eleven months, and the young follow their mother about for six months or perhaps longer. It is a well known fact, of course, that the dam suckles her young at her breasts, there being two mammae, which are post-axillary in position.

In concluding, it gives me pleasure to state that in my account of this animal, I have been much assisted through my perusal of True's history of it in that admirable work, recently published by the United States Commission of Fish and Fisheries, entitled "The Fisheries and Fishery

calves at a birth, how the latter are suckled, their size and appearance, and how long they remain with their dam, and a great deal of their structure and anatomy, are all subjects almost unknown to us.

THE MASSACHUSETTS FISH AND GAME PROTECTIVE ASSOCIATION gathered together its members for the first time this autumn on Tuesday, Oct. 11, and by general consent the meeting was pronounced a decided success. Fifty members and their friends, among whom was Mr. A. G. Faye, Jr., editor of the new Boston sporting journal, *Judge and Jury*, as a special guest of the association; sat at the tables of the Tremont House. It being the first meeting since June there was very little business to be transacted; the only new members were H. M. Daggett, Jr., and W. M. Bunting, and the major portion of the evening was given up to social chat. President Samuels first called upon Mr. Walter M. Brackett, who gave an account of salmon fishing in Canada, and following him Mr. Samuels gave some very entertaining and amusing reports of his own experiences in Cape Breton, where he had spent the summer months. Mr. Faye gave a very practical talk upon methods for furthering proper protection of game, and suggested that the association should extend its correspondence and make affiliation with all sporting clubs in the State, both for the good of all and for its own interests, especially in forwarding the good work.—HUB.