

ART. VII. ON THE MAMMALIA OF NOVA SCOTIA. BY J. BERNARD
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(Read April, 1868.)

IN the last papers I have had the honour to read before you, you may recollect I considered the very marked and boreal family of weasels. Following the classification of the Smithsonian Institute, I shall bring to your notice this evening the somewhat aberrant group of the otter, the skunk and the raccoon. The otter, a boreal fauna, and allied to the mink,—the skunk and the raccoon, almost the sole representatives of a more southern fauna, and perhaps our latest arrivals in point of time. But to give to the paper a greater completeness, I will enumerate the whole fauna of the Province as identified by myself. I think this list will include all, with the exception of a shrew, or a mouse or two, yet to be added—I know of no other list except my own, and in using the term identified by myself, I only wish to add to it the interest of personal verification. I shall use the classification of Dr. Baird (Smithsonian Institute), with the synonyms of Sir John Richardson when procurable, thus using the best American and English authorities, being satisfied that whilst no one can be but charmed by the accuracy, exactness and minute description of the great English traveller; on the other hand they must equally acknowledge the exhaustive labour of the American naturalist, though they may differ from him in some of his conclusions.

CHEIROPTERA,—Bats.

Vespertilio Subulatus, (Say, Richardson), Say's-bat.
Vespertilio Cinereus, (P. D. Beauvois), 1796) } Hoary Bat.
Vespertilio Pruinosus, (Richardson),

Dr. Allen, (Monograph American bats 1864,) puts this last species in the new genus "Lasiurus." It is very rare in the Province, whilst Say's bat is very common. Capt Hardy gave me a bat whose interfemoral resembled "evotis" (Allen). I am unwilling, however, to make it this species.

INSECTIVORA,—Shrews.

Sorex Palustris, (Richardson,) Marsh Shrew.
Sorex Fosteri. (Richardson,) Foster's Shrew,

- Sorex Platyrinus*, (Baird,) Eared Shrew.
Sorex Thomsoni, (Baird,) Thomson's Shrew.
Sorex Acadica ? (Baird,) Nova Scotia Shrew.
Blarina Talpoides, (Gapper, Baird.)
Blarina Brevicauda, (Say, Baird.)
Blarina Angusticeps, (Baird.)
Blarina Cinerea, (Backman, Baird.)
Condylura Cristata, (Baird.)
Condylura Macroura, (Richardson.) } Star-nose Mole.

Of these species *Palustris* would undoubtedly be placed in Baird's new genus, "Neosorex." I have put a mark of interrogation after "Acadica," as it is as yet undescribed, except by myself, and may turn out "Thomsoni," (see Transactions, Nova Scotian Institute, 1864). These long-tailed Shrews are by no means uncommon. Following other authorities, I have distinguished "Talpoides" from "Brevicauda," and though there is undoubtedly great divergence in colour and size in our "Blarina," yet all the typical marks remain the same. I have been fortunate in obtaining a specimen, I believe the second one known of the very rare "Angusticeps." Of Moles I have never met with one in the Province. They are represented by the one species of *Condylura* which is common. These Shrews brave the coldest winter—their minute tracks are seen on snow, at least four feet above the frozen ground, beneath which are their holes; through this snow they must penetrate in coming to the surface. They are seen swimming in ice mantled streams. Hunters cutting an ice hole in a frozen stream for a drink have had them darting from below almost into their mouths, and as suddenly plunging in again.

CARNIVORA,—Flesh eaters.

- Lynx Rufus*, (Guldensteadt, Baird,) Wild Cat.
Lynx Canadensis, (Geoff, Baird,) } Loupcervier.
Felis Canadensis, (Richardson,) }
Canis Occidentalis, (Richardson,) Wolf.
Vulpes Fulvus, (Richardson,) American Fox.
Mustela Pennanti, (Erxleben,) *Canadensis*, (Richardson,) Fisher.
Mustela Americana, (Turton, Baird,) *Martes*, (Richardson,) Marten.
Putorius Cicognanii, (Bonaparte, Baird,) Small Weasel.
Putorius Richardsonii, (Bonaparte, Baird,) *Erminea*, (Richardson.)
Putorius Noveboracensis, (Dekay, Baird,) White Weasel.
Putorius Vison, (Richardson, Baird,) Mink.

Putorius Nigrescens, (Audubon, Baird,) little Mink.

Lutra Canadensis, (Sabine, Richardson,) Otter.

Mephitis Mephitica, (Shaw, 1792, Baird,) *Americana*, (Richardson,) Skunk.

Procyon Lotor, (Richardson, Baird,) Raccoon.

Ursus Americanus, (Pallas, Richardson, Baird,) Bear.

Of these fifteen species, we find the Loupcervier, a truly boreal lynx, with its congener the wild cat, a more southern form, and no doubt of much later appearance; the wolf in his white or grey variety, endeavouring in vain to re-habit the Province. During the last sixty or seventy years they have constantly appeared, single and in pairs, at each extremity of the Province, and then have been unheard of for years. The fox, very numerous, of great beauty and lustre of fur, but subject to nigritism and varying according to its intensity, from the red, to the cross, the silver grey, and black. The magnificent tree weasel, the fisher, its congener, the American marten, only lately separated from the pine marten of Europe, and still more recently classed as a variety of the Russian sable, (*M. Zabellina*.) The ermine weasels, (though the common short tailed weasel common in New England is here unknown), the American otter, now separated from the European species, the skunk and raccoon both later in their arrival (almost during our own times), and of a southern form, and the truly boreal form of the American black bear, perhaps our earliest carnivora, and destined to be the latest. His vegetable diet of berries and roots, and his long winter sleep mark him the inhabitant of sterile and frozen lands.

• RODENTIA.

Sciurus Hudsonius, (Pallas, Richardson,) Red Squirrel.

Pteromys Hudsonius, (Gmelin, Baird,) *Sabrinus*, (Richardson,) Flying Squirrel.

Tamias Striatus, (Linn. Baird,) *Lysteri*, (Richardson,) Ground Squirrel.

Arctomys Monax, (Linn., Baird, Richardson,) Wood Chuck.

Castor Canadensis, (Kuhl, Baird, Richardson,) American Beaver.

Jaculus Hudsonius, (Zimm., Baird,) *M. Labradorius*, (Richardson,) Jumping Mouse.

Mus Decumanus, (Pallas,) Brown Rat.

Mus Musculus, (Linn,) Common Mouse.

Mus Rattus, (Linn,) Black Rat.

Hesperomys Leucopus, (Rafinesque, Baird,) White-footed Mouse.

Hesperomys Myoides, (Baird,) Hamster Mouse.

Arvicola Gapperi, (Vigors, Baird,) Gapper's Mouse.

Arvicola Riparia, (Ord, Baird,) Meadow Mouse.

Fiber Zibethicus, (Baird, Richardson,) Musk Rat.

Erethizon Dorsatus, (Linn., Baird,) *H. Pilosa*, (Richardson),
Porcupine.

Lepus Americanus, (Erxleben, Baird, Richardson), Hare.

Of the sixteen species here enumerated we find a tree squirrel, a flying squirrel, and a ground squirrel, all northern forms, two partially hybernating, and laying up winter stores, the other totally disappearing beneath the ground in winter. We find also a marmot peculiarly northern in his hybernation and gross fat. I cannot but think that *Pruinosus* of Richardson will be found only a northern variety of *Monax*. Specimens are found here so very hoary, with the hair on the shoulders so much longer than on rump. I have also seen them flattening themselves on the ground, as Audubon describes, *Pruinosus* as doing at the Zoological Gardens, London. To the historical beaver succeeds the sub-family of mice. Of the three introduced species, the common mouse has penetrated every where, the brown rat chiefly on the sea-board, and the black rat very rare; I suspect some, if not all, come to us from the West Indies. Our indigenous species so far identified are the very beautiful jumping mouse—the white-footed mouse with his closely allied congener, the hamster mouse, differing only in having a longer tail, and cheek pouches, and two voles. I think another vole may be added to our list. The jumping mouse and the voles all hybernate, the others but partially, laying up stores of beech mast and grain in hollow trees, and often found lively at mid winter. The musk-rat, porcupine, and varying hare, all northern forms, close the list of our Rodents.

RUMINANTIA.

Cervus Alces, (Linn., Richardson,) }
Alces Americanus, (Jardine, Baird,) } The Moose.
Alces Muswa, (Richardson,) }

Rangifer Caribou, (Ham, Smith, Baird,) }
Cervus tarandus sylvestris, (Richardson,) } Caribou, Reindeer.

Our list ends with the truly noble, antlered and boreal forms of our two species of deer. Of these the caribou supposed identical with the reindeer of Europe though not proven, but differing from the barren ground caribou of the Arctic circle, is becoming extinct the most rapidly. Though following Jardine and Richardson I have given the specific "Americana" and "Muswa" to the moose, there can no longer be a doubt of its complete identity with the Elk of Sweden and Norway. Captain Hardy, R. A., a member of our Institute, (than whom there can be no more competent authority,) fresh from studying the moose in the Nova Scotia forest, with all his recollections, drawings, and measurements, has compared him with two young elks from Norway, the property of the Prince of Wales, and pronounces them identical. (See "Land and Water," Aug. 15, 1868, with illustrations.) In Captain Hardy's sketch the forehead appears broader than in the moose. This is the point insisted upon by Richardson as the difference between the two skulls.

In not adding *Meriones (Jaculus) Acadica*, (Edn. New Phil. Journal, 1856,) to the list, I owe it to so learned a naturalist as Dawson to explain that the specimens upon which he founded his new species, and which he obtained from Mr. Winton, Halifax, were prepared for myself, and described as the young of *J. Hudsonius*, (Zimm.,) in a lecture before the Mechanic's Institute, Halifax, about 1850, and that though being unwilling to differ from him, and still more unwilling to lose a mammal from our Province, I still retain my opinion. Of animals not identified by myself, but sometime to be found in the Province, I think the Virginian deer (*Cervus Virginianus*) will be found in the Cobequid hills, as I personally know they have been taken at Dorchester, N. B., near the boundary line. There is a tradition of a wolverene (*Gulo luscus*) having been taken in the same wild country. A large black squirrel skin (*Sciurus Carolinensis*) with nigritism, was given me from Cumberland. Of the Pinnipedia or seals and Cetae or whales, I have identified none. From the labours of Dr. Gill we unexpectedly learn that our common seal is identical with the European, (*P. Vitulina*,) and the harp (*P. Groenlandica*,) and the grey seal (*H. Griseus Neilson*,) are all common to each continent. This identity running through the fish, amphibious mammals, the sea birds, and larger land mammals, seems a good proof of our common glacial period and gradual emergence. Of extinct species, during historic time, we may enumerate the walrus, with its companion of another class, the great auk. Of prehistoric remains, I only know the solitary gigantic thigh bones of a huge mammal found at Cape Breton. Of those whose early extinction, perhaps in our own times we may reasonably expect, we may enumerate the fisher, (*M. Pennanti*), now very rare, and next the marten, (*M. Americana*). Both these great tree weasels require dense cover. The beaver, twenty-five years ago nearly extinct, is rapidly recruiting. The less value of his skin since velvet hats have been patented is not sufficient to account for his re-appearance. The few or no Indians now trapping in our forests is perhaps another cause. With these exceptions, allowing the same influences to exist, I see no reason why we should not retain our present fauna for centuries, including the large

ruminants. Our last arrival was the wolf, endeavouring in vain to rehabit his old domains, to whom the skunk and the raccoon alone give precedence. All these coming in to us from the wild region of the Cobequid hills. Of introduced species, with the exception of the mice, we have only the horse (*E. Caballus*), and the rabbit, (*Lepus Cuniculus*). Both these species have been allowed to assume their feral state on Sable Island, a desert island about ninety miles south-east Nova Scotia, in the Atlantic Ocean. Whilst the rabbits in fifty years have returned to one common silver-grey tint with white collars, it is curious to remark how the horse in one hundred and fifty years, the produce no doubt of the New England stock, has returned to the habits and form of the primal stock, or wild horse of antiquity, and reproduced all varieties of color, not only the bay, black and chesnut, but the rarer colors of piebald, duns, isabella's, blue duns, and duns with striped legs and black lists down the back.

We have so far adhered in our paper this evening to strict classification, using the modern acceptation of genus which, unlike the older naturalists' usage, seems to class animals by their differences, rather than by their similarities, (Linnaeus classing the elk with the stag, considering his many points of similarity; H. Smith considering only his differences, classing him by himself). Is it too much to say that the modern system of sub-genus has become too fine and wire-drawn, and operates unfavourably to exact knowledge of the habits of the animals themselves, making a speciality of what should be open to all lovers of nature. However this may be, there is another way of studying our fauna far more agreeable, as it connects us with geology and geography, and allows speculation instead of exact measurement and minute detail. This is to take the order of their presumed appearance on our part of the globe. Our Province glaciated to the summits of its hills and then slowly emerging amid towering ice-bergs, and washed by frozen seas, must have first attracted those animals which live by the sea, since this half frozen ocean had long before been floored by mollusks, upon whom countless series of fish had for ages fed and died. The *Cetæ* then, as they do now on the Arctic

Circle, may have sported and wallowed over Blomidon or the Cobequid. Following them, came those fur clad fish, the seals; then, no doubt, the polar bear now long extinct, may have denned on the Ardoise or trapped seals in Bedford Basin. This accords with geological facts, the shelled mollusks are the floors of ancient oceans. Fish appear long before air breathers in carboniferous strata. The slowly emerging Province may now have dried itself into bog and morass, insect life is humming about the marshy pools. Our one species of bat so like the pterodactyle harmonizes well with the moose, whose stilted leg and cavernous head closely resemble the extinct fauna of ancient time. The caribou or reindeer on whose horn pre historie man has left his early rude carving, soon joined him; then one would suppose the hybernating class, all those who slept out the long Arctic winter's night, the bear, the beaver, the musk-rat, the marmot, the mice and squirrels, all vegetable eaters but the bear, (and he no doubt then,) would follow; the hare would very early put in her appearance together with the porcupine. A more genial clime and a warmer sun now lights our landscape. The Arctic currents turned aside by the rising continent, have swept away the ice bergs. The moose and cariboo browse over the barrens, the beaver and musk-rat form their rushy domes, the various mice collect with the squirrel their little stores of cones and seeds, the hare and porcupine gather their frugal meal of grass or pine. The most of them sleeping out the long wintry night, none preying on the other. And now come the carnivora. The feast has been for ages preparing, the voracious guests steal slyly in to devour it. The shrews, those hardy imps whose tiny limbs are ones wonder, making their needle tracks on snow whose temperature is 18 below zero, may have been of the first arrivals. The fierce and bloody weasels now attack the mice and the hares, on the land, the fish on the water; the corpulent bear now changes his vegetable diet; the northern lynx creeps along, followed ages afterwards by her congener the wild cat; the crafty foxes and stealthy wolves follow, and the guest roll is complete. These now, by natural laws, keep at a poise production, and supply. Presently man makes his appearance, and both guests and viands begin to disappear. By stone arrow

head, by fish bone spear, by rude flint knife, and trap stone axe, by bronze sword, unwieldy matchlock, clumsy musket, Queen's arms, or Minie rifle, as Esquimaux, Micmac, Northman, Frenchman or trader, sporting noble or Englishman; by every art in every nationality, by pit-fall, trap-net, or snare, man more crafty than fox or wolf, more murderous than ermine weazel, wars on all. The flabby Esquimaux, clothed in deer skins, no longer drives the deer; men of the nineteenth century, clothe themselves in broad-cloth spun from the wool of sheep, replacing the deer on our ancient hills. It is consoling to think as we have seen so many of the guests out, we have also in our own time witnessed some late arrivals. Twenty years ago Mr. DOWNS informed me the skunk was so rare that he had obtained but one skin, and he had some idea of importing a few from New Jersey, where he trapped them as a boy. They have increased so rapidly since, that their skins are quite common in our market. The raccoon has within the last twenty years spread itself along the north side of the valley of Annapolis. They were unknown by the Indians, a certain sign of their strangeness. The beaver is again rapidly increasing in the western counties, though, as yet, unknown in the eastern. Old hunter Hardwicke was said to have trapped the last one in Annapolis county thirty years ago; since then forty or fifty skins come to market from one locality during a year. It is curious too to speculate, that almost the first arrival will be the last seen out. The interior of our Province is divided into several great lake basins, each surrounded by barrens and swamps. From the great Shelburne basin flow the Clyde, the Tusket, the Liverpool, the LaHave into the Atlantic; and the Lequille, the Bear, and the Sissiboo into the Bay of Fundy. This basin is so sterile that no man can live on its borders by the soil, the timber too is too small to tempt the lumberman. Wide shallow lakes, dotted by innumerable islets, break the dreary surface of the sterile bog and barren. Here is the home of the moose, among these islets, secure from bears she hides her fawns. Pressed in on all sides by advancing cultivation, with no back ground of forest, as in Maine, New Brunswick, or Canada, to retreat upon, she here makes her stand, having be-

come almost extinct in those countries. These barrens and intricate impassable swamps will be in future ages to Nova Scotia what the Black forest is to modern Europe. There the wild bull which the Imperial Roman described, still defies in his impenetrable haunt the throng of modern men, and so in ages to come our moose will hold good his feeding ground. Men with their governments will crumble, but the same utterly barren ranges will still exist; the same countless withered rampikes will rear their spiked heads as now; the same dwarf and scrubby pines will clothe their bases as to-day; yet those whose camp fires are wreathing round these withered spectres, will not be our worthy President, or our friend and member Captain Hardy, whose graphic notes of these scenes we have just published, but perchance the young Princes Royal of Carolina, who have come north with the young Dukes of New York to strengthen their enervated limbs by stalking a moose with the Prince of Quebec, heir of Alfred fourth King of Canada, attended by the Earls of Blomedon and Cobequid. Thus the moose, whose bones have been found mingled with the cave bear, and other mythic phantoms of prehistoric times, may be the last survivor of all.

Taking up in their specific order, each mammal, as I said in the beginning of this paper, I will proceed with the American otter.

Lutra Canadensis, (Sabine, Richardson,) the Otter.

Of the skins examined by me at Halifax, they were all dark liver brown on the back, the under parts lighter. The cheeks, chin, throat and breast were greyish white. The fur was of two kinds, the outside long, brown and shining, the inside soft and lighter. Sir John Richardson gives the colour equally dark below as upon the back. They measured from four to five and six feet, including the tail. They are not very numerous, perhaps six hundred skins may be the annual catch. For so large a mammal, the otter keeps a very close cover, being seldom seen during the summer. In winter when the lakes are frozen he is compelled to take long journeys through the forest in

search of open water. If the snow is deep and no crust, owing to the shortness of his legs, and long low tail, he leaves one uninterrupted trail behind him. I have tracked these for miles, crossed and recrossed by the tracks of grouse, hares, squirrels, shrews, moose, lynxes and bears. The stern solitude of our short Arctic day in the forest is greatly enhanced by the marks of a populous gathering over night. Like Baal's priests, they have all left their footprints behind them. The hunter loves them not—a clear track without a cross shows the beast a few miles ahead. In the lettered page that nature has written on the snow for his guidance, he reads a day, two days, or a week ago, he passed along: memories of these sylvan readings how sweet you are! The otters that I have seen were with broad flat heads, short ears, scarce appearing above the fur, flattened like an angry cat, a broad naked muzzle, thick moustache and round large upper lip, the eye cruel, but inexpressive, light in colour, and too near the nose for beauty; the legs very short and strong, the whole body round, and the tail long and compressed, but joined to the body by a very broad base. In repose they were fond of lying on their bellies, with the hind legs turned up behind, as a duck's foot in swimming. They held their fish in their fore paws, and devoured it by a series of snarling bites. I have no language to express their tortuous, swift and graceful glides in and out the water, and over the ground. They resembled young furred anacondas, not as we see them half alive in our shows, but stimulated by a glorious African sun and burning desert sand. They are said to be fond of sliding down the hills, (moist clay in summer, snowed in winter,) and to continue it for hours. By the best authorities, our otter is specifically distinct from *L. Vulgaris*, or the European otter, the skull of ours is much broader and larger, and the naked muzzle double the size.

Mephitis Mephitica, (Baird, from Shaw.)
Mephitis Americana, (Richardson, Sabine, DeKay,) Skunk. }
Mephitis Chinga, (Tiedman, Wagner, Audubon.) }

Of the some dozens of skins of this late arrival among our fauna, which I have examined, they have all been of that

variety which Baird makes typical for the northern skunk. Black, with white line down the forehead, yellowish white rhomboid spot on the back of neck, from which issue from either posterior corner two parallel white lines, soon diverging and losing themselves on the flanks, and a white tip to the tail. I have never examined one in the flesh. From well mounted specimens we recall a handsome lively little animal standing high on pretty feet, a small and arched head, ears small, a high back, and a very fine brush carried over his back. He is bold as well as handsome, and goes out of his path for no one. Once or twice I have met him in the open, by evening twilight, or at noon, trotting through the dark forest. He much resembled a poodle dog, his long curved nails rattling as he ran. The stories of the offensive fluid which he ejects from glands on either side of the rectum are not exaggerated. Though it appears to me that an open cultivated country is much more favourable to its diffusion than a wooded uncultivated one. I have offensively perceived the odour for nine miles. The main land being that distance from the island where I was, and on which none were living. I have never known our forests tainted to so great an extent. One can scarcely believe the greenness of the gentleman who on his wedding tour espied one of these innocents in the road, easily captured it, as they will allow you, and presented it to his bride sitting beside him in his carriage. Cupid loved the soft muff and caress; but a sudden jolt of the carriage alarmed him, and an one who knows them, will never ask what happened then. Equally incredible are the stories of the Indians who love the odour, willingly eating the tainted meat; yet I have heard both vouched for. The specific "Mephitica" was first given by Shaw, but using the genus *Viverra*. Cuvier, separated it into the genus *Mephitis*, and Baird, following the strict law of priority, still retains this specific. May I be allowed to say this strict law of priority, allowing, as it does, no writer a choice or alteration of name, is the only compass that will steer us out of that vast ocean of synonymy which threatens to engulf the science?

Procyon Lotor, (Richardson, Baird). } Raccoon.
Ursus Lotor (Linn, Erxleben).

Of the many skins of this also late arrival amongst us which I have examined, as well as living and dead specimens, they agree generally with the description of Audubon, and Baird. I think our raccoons are larger and darker, and among them a greater tendency to negritism. Among many dark skins, I have seen one that in colour resembled the best specimen of the black fox, the rings upon the tail being barely discernible. Usually he is of a yellowish-grey, mixed with long black hairs, and a little rusty thrown upon shoulders and rump. Audubon, speaking of the black patch on either side of the face, says it "passes the eyes over the nose." I think this must be an error of the printer, as all our specimens have the nose very conspicuous, a grey ridge between the spectacled eyes. He is rapidly increasing in our forests, and doubtless hibernates during the winter months. I have never met his tracks in the snow, but have known of his having been cut out of a hollow tree in mid-winter, in which a hog that had escaped and run wild had also taken her temporary refuge. A fowl-house, at a farm where I was one night, was diligently searched to discover the reason of the discordant screams of its inmates. The flare of the lantern, after looking everywhere, was at last reflected by a pair of twinkling eyes in the farthest corner of the roof-tree. We soon had the pretty black paws and beady eyes relaxed in death, much more, I own, to the satisfaction of the farmer than my own. He has penetrated the whole length of the north side of the valley of Annapolis during the last thirty years, in such numbers as to damage the crops of the mountain farms; whilst on the southern side, separated by river and basin, he is unknown. Our Indians did not know him on his first invasion. May we hope that he will make good his quarters, and that his prying, mincing gait, droll frolics, and round, humpy form, commingling agility with strength, may never be wanting to our piney woods or brawling streams.

NOTE.—Les Carbot, who visited Nova Scotia in 1606, speaks of small animals, very round and fat, which had black paws like monkeys, as plenty there at that time. These must have been raccoons. I note this as curious that they should retire before civilization, and then return 300 years afterwards under so different circumstances—to cultivated fields instead of primeval forests, to corn and maize instead of wild fruits and berries.