208

Mammals of the Mexican boundary of the United States

Edgar Alexander Mearns

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 56

MAMMALS OF THE MEXICAN BOUNDARY OF THE UNITED STATES

A DESCRIPTIVE CATALOGUE OF THE SPECIES OF MAMMALS OCCURRING IN THAT REGION; WITH A GENERAL SUMMARY OF THE NATURAL HISTORY, AND A LIST OF TREES

BY

EDGAR ALEXANDER MEARNS, M. D.

Major and Surgeon, U. S. Army

PART I

Families Didelphiidæ to Muridæ

WASHINGTON
GOVERNMENT PRINTING OFFICE
1907

PUBLISHED APRIL 13, 1907.

Genus CASTOR Linnæus (1766).

Castor Linnæus, Syst. Nat., 12th ed., 1766, I, p. 78.

The upper molar teeth are subequal, each with one internal and two external enamel-folds; the stomach has a large glandular mass situated to the right of the œsophageal orifice; the anal and urethrogenital orifices open within a common cloaca; the tail is broad, horizontally flattened, and naked; and the hind feet are webbed. (*Flower and Lydekker.*)

CASTOR CANADENSIS FRONDATOR Mearns.

BROAD-TAILED BEAVER; SONORAN BEAVER.

Castor canadensis frondator Mearns, Proc. U. S. Nat. Mus., XX, p. 503, Jan. 19, 1898, (advance sheet issued Mar. 5, 1897; original description.—Miller and Rehn, Proc. Bost. Soc. Nat. Hist., XXX, No. 1, Dec. 27, 1901, p. 63 (Syst. Results Study N. Am. Mam. to close of 1900).

[*Castor canadensis*] *frondator*, Elliot, Field Col. Mus., Zool. Ser., II, 1901, p. 116 (Synop. Mam. N. Am.).

Castor c[*anadensis*] *frondator*, Elliot, Field Col. Mus., Zool. Ser., IV, 1904, pp. 159 to 161, fig. 30 (skull of type); fig. 34 (animal). (Mam. Mid. Am.).

Päh-höné-äh of the Hopi Indians.

Ap-ē'-nä of the Hualapai Indians.

Type-locality.—San Pedro River, Sonora, Mexico, near Monument No. 98.—(Type, skin and skull, No. $\frac{20715}{56883}$, U. S. National Museum.)

Geographical range.—This form occupies the southern interior area of North America, ranging north from Mexico to Wyoming and Montana, its habitat being, of course, restricted to the vicinity of wooded streams, which it follows through the Austral and Transition zones.

Description.—Larger than the beaver of Canada, paler and different in coloration, with a much broader tail. Above russet, changing to chocolate on the caudal peduncle above, and to burnt sienna on the feet; toes reddish chocolate. Below grayish cinnamon, brightening to ferruginous on the under side of the caudal peduncle. Sides wood-brown, enlivened by the tawny olive color of the overhair. Length, 1,070 mm.; length of tail, measured from anus, 360; length of bare portion of tail, 125; height of ear from crown, 31; height of ear from anterior base, 35; distance from tip of nose to eye, 68; from tip of nose to ear, 125; nose to occiput, 165; length of manus, with claw, 82; length of pes, with claw, 185. Skull, 133 mm. by 99. Weight, 62 pounds avoirdupois.

Cranial characters.—The skull of the European beaver (*Castor fiber*), which is readily distinguishable from that of the Canadian beaver (*Castor canadensis*) by its slender build, lengthened nasal bones, and elongated rostral portion, presents still greater differences

when compared with the beaver of Arizona and Sonora. There being at present no forest connection between the habitats of *Castor fiber* and *C. canadensis* in their respective geographic ranges, and consequently no continuity of habitat, there can be no question as to their specific distinctness. The skull of *C. canadensis frondator* (fig. 57) differs from that of typical *C. canadensis* in being much larger, with more spreading zygomata.

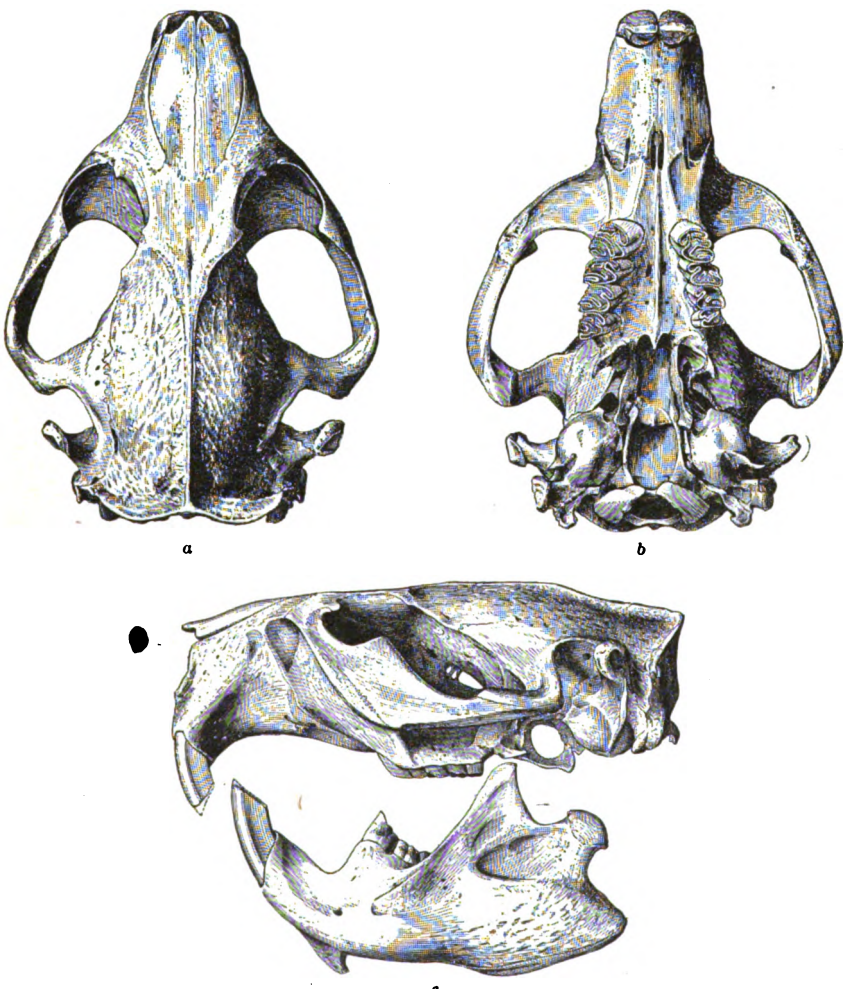

FIG. 57.—CASTOR CANADENSIS FRONDATOR. (TYPE, CAT. NO. 35883, U.S.N.M.) *a*, DORSAL VIEW; *b*, VENTRAL VIEW; *c*, LATERAL VIEW.

Variations.—In the year 1885 I purchased from a professional trapper 17 beaver skins, taken on the Verde River during the winter of 1884–85. These skins were dried in oval shapes on looped sticks in

the usual way and weighed 29 pounds avoidupois, costing $1 a pound. The fur was quite heavy, and was made into capes, muffs, and a coat, which are still serviceable. The adult skins measured as follows: 1,090 by 700 mm., 1,060 by 720, 1,010 by 840, 970 by 780, 950 by 650, 940 by 770, 930 by 800, 930 by 700, 920 by 750, 900 by 770. Four young of the year measured 760 by 600, 710 by 600, 670 by 580, 695 by 620. One in the second year measured 720 by 610. Two in the third year measured 820 by 680, 810 by 720. As in all Arizona beavers, the hides are thick and indurated, especially those of old males that have many scars from fighting; and the coat is poorer in quality and less dense than in northern skins. The fur, however, is quite full and handsome. Ten of these skins are of adults, taken between December and March, and stretched to a nearly perfect ellipse. Of these, No. 168 (original number) is the largest, darkest, and handsomest, being in perfect winter pelage. The skin measures 930 by 800 mm., and weighs 2¼ pounds. There is an area of dark, reddish brown extending from the forehead to the root of the tail, where the color changes to a darker hue of shining vinaceous-chestnut, a lighter shade of which extends to the under surface of the caudal peduncle and inner surface of the thighs. The sides are rather uniform (slightly reddish) fulvous. The underfur is of about the same color terminally but grayish at the base of the hairs; that upon the dorsum is rich brown. There is no ventral chestnut stripe in this specimen.

The remaining nine adult winter specimens exhibit certain color differences amounting to a considerable variation. No. 169 has the dorsum paler and less reddish; the sides and belly are uniformly brownish gray, with no tinge of red or fulvous, while the rump is paler than the back, and more yellowish than in the above specimen, this shading into dark vinaceous posteriorly and beneath. The skin measures 1,090 by 700 mm.

Between the extremes above described are various gradations in color. In some skins there is a distinctly darker ventral stripe, and occasionally the sides are of a brighter yellowish fulvous. In some the top of the head is darker, in others lighter, than the rest of the dorsum; but in all the muzzle, sides, and under surface of the head and neck are pale, so that the skin exhibits a triangular dark patch above, corresponding to the crown of the head.

Young of the year (from four skins taken in midwinter).—These are strikingly paler than adults at the same season. They present a central area of reddish brown and two broad, lateral bands of nearly uniform brownish gray, faintly washed with fulvous. The ventral surface is appreciably darkest in the median line. The sides of the head are washed with fulvous. The rump and base of tail are pale chestnut-fulvous, with less of the vinaceous tint than in adults.

Three immature skins, presumably in their second and third years,

respectively, present color characters intermediate between those of the young of the year and the adult.

Summer pelage of adult (adult male No. $\frac{3}{1}\frac{3}{8}\frac{3}{8}\frac{4}{4}$, coll. Amer. Mus. Nat. Hist., New York, taken at Fort Verde, Arizona, August 16, 1884).—Upper parts pale reddish fulvous, much paler and more uniform than in any winter specimen. A darker vertebral area is indicated. The rump and upper side of the tail are considerably paler and more yellowish than in winter. The long hairs of the sides, giving the general body color, are paler yellowish fulvous; and the same shade prevails on the under parts, where the overhair is very scanty. Along the middle of the belly is a band of dark, shining chestnut, a paler, barely apparent shade of which extends forward to between the fore legs and more distinctly backward to the vent. The under side of the tail, posterior to the anal orifice, is reddish chestnut, paler than the dark area of the middle of the belly. The bare sole of the hind foot is fringed behind the heel with a band of long, chestnut-red hairs. The upper surface of the hind feet is covered with coarse hairs of a dark vinaceous color, with a few markings of fulvous, especially upon the terminal portion of the toes. The front, sides, and under surface of the head and the fore legs and feet are a paler shade of fulvous than the rest of the body; and the feet are marked above with a few irregular vinaceous blotches (mixed with brown) similar to, but paler than, those of the hind feet. The soft underfur is dark, grayish brown on the upper parts, becoming pale grayish on the under parts.

Very young specimens, taken in June, have a drabish coloration.

Remarks.—The beaver of Canada and the northeastern United States (*Castor canadensis canadensis*) is of a beautiful glossy bay on the upper surface, paling to chestnut on the head and rump. The under surface is seal brown. Sometimes the color is still darker, the back being blackish brown, the caudal peduncle burnt umber, and the under side of head vandyke brown. The feet are seal brown. I have examined thirty-three skulls and a large number of skins of *C. canadensis frondator*, from Arizona and Sonora. In old males the total length reaches 1,130 mm., and the bare and scaly portion of the tail measures 285 by 155. Adult males weigh 60 pounds and upward; females 40 to 50 pounds.

Beavers are found throughout the Rio Grande Valley, except where civilization has caused their disappearance. At El Paso I bought some beaver traps from a trapper, but was unable to catch any beavers. Some were living on Las Moras Creek, near Fort Clark, Texas, but they also eluded me. Not having obtained a specimen, I can not say whether the Texas beaver is most like *Castor canadensis carolinensis* Rhoads or the present subspecies. Skins of the Arizona beaver make elegant rugs, robes, and even fur trimmings when the long over-

hair has been plucked out; but the price at which they were sold shows that beaver trapping was not a remunerative occupation in Arizona, which is further attested by the great abundance of these animals along the rivers of the Territory during the early eighties. I have had large skins offered me, prepared with less skill and pains than those above described for 50 cents apiece; but the value has risen so that a trapper named Milligan, who obtained more than 100 skins on the Gila and Verde rivers during the winter of 1886–87, selling them by the pound, received an average price of $5 apiece. The largest beaver taken by Mr. Milligan weighed 73 pounds.

Habits and local distribution.—Signs of the beaver were evident on nearly all of the streams of the Colorado Basin visited by me from March, 1884, to May, 1888. I always found this animal to be excessively shy, secretive, and difficult of observation, in these respects quite different from the half-tame beavers of the Yellowstone National Park. The slight amount of information respecting them that I was able to obtain while in Arizona can be best presented in the form of extracts from my diary of those years, as follows:

July 18, 1884, Fort Verde, Arizona.—Beavers are abundant in pools of Beaver Creek from above Montezuma Well to the Verde River. Mr. Henry Mehrens, a settler living just below Montezuma Well, says he frequently sees them in pools of Beaver Creek, which are there densely bordered by tule (*Scirpus*) and surrounded by willow and cottonwood trees, upon which they feed. He informed me that beaver frequent the irrigation ditches of the ranches along the stream, doing some damage to the ditches and shade trees planted along them.

August 16, 1884, Fort Verde, Arizona.—I killed an old male beaver about 3 miles above the post of Fort Verde, in the Verde River. I first saw it in the river a good way above me, floating like a piece of driftwood, low in the water. For some time I was unable to make out whether it was an animal or not; but I soon saw it move its head up and down slightly, and then I felt sure that it was a beaver—the first one I ever saw. Every walk I had taken along the banks of the Verde River had revealed to me evidences of the abundance and industry of this singular beast. Large cottonwood trees were to be seen with trunks gnawed half through, which, on the next occasion that I visited the spot, were lying prostrate, felled by the beaver. Numbers of cottonwood trees had been cut down by them during the preceding two months, and in some places every tree near the water and some good-sized ones at quite a distance from the stream had been cut, until the spot resembled a clearing made by the woodman's ax. The saplings and limbs were frequently dragged to form a large windrow beside the river bank, in doing which well-made paths had been swept in the sand and loam by the industrious beavers. I had not seen any typical or recently occupied beaver dams, although there were re-

mains of several old ones near the post of Fort Verde. But notwithstanding the plentitude of beavers not one had before been seen, although the streams had been forded at night and in the evening many times. This one was seen on a cloudy day, after a shower, and was shot from an ambush as it swam slowly down the river channel, with only its head visible above the surface of the water most of the time, although it sometimes floated higher and drifted like a board. It was so large and heavy that it was with difficulty removed to a small tree and hung up in the shade.

August 11, 1884, Fort Verde, Arizona.—Visited a spot two miles above the post where beavers had been hard at work cutting cottonwood trees and lopping off the branches close to the trunk. Well-worn paths had been made by them when carrying the branches to the river. I was walking silently and cautiously in the shade of the cottonwoods at a place where the bluff bank was about 10 feet high, when I noticed a ripple proceeding from the nearer shore beneath some jutting roots and brushwood, and crept stealthily to the shore and saw that there was a great commotion in the water. In fact, the whole stream was quaking from the rapid movements of some animal beneath the surface. Soon the head of a large beaver emerged from the shallow water on the opposite side, and in a moment another and another. It proved to be a beaver mother giving instructions to her kittens in the art of swimming. I quickly pulled both triggers of my shotgun. Then there was a splash, and for a moment the water and sand fairly boiled, after which there was only the spasmodic kicking and flapping of a wounded beaver, which was secured, not however without difficulty, from a dangerous quicksand among some stranded snags of trees about which the beavers had been trying to build a dam. On this account the beaver colony was not subsequently molested by me, as I was desirous of observing their method of work on the attempted dam.

August 21, 1884, Fort Verde, Arizona.—This evening I repaired to the spot where I shot the beaver and watched for these animals until it was pitch dark. I saw a large beaver at work on the dam, but it flapped its tail on the water and dived upstream, and I did not see it again. As the darkness increased I could hear them splashing in the water and flapping their tails on the ground with a sharp thud from time to time, but I could see nothing, as the night was dark save when a distant flash of lightning illumined the water for a second.

August 22, 1884, Fort Verde, Arizona.—The beavers are putting forth strenuous efforts to cut down all the timber near their dam. I am interested to see whether they will actually succeed in cutting off some large trees from which they have stripped the bark and on

which they have commenced to chisel the wood. Some of these trees are cottonwoods, two feet or more in diameter. Beavers have already felled some of the largest trees in the vicinity, and it is probable that others will soon follow. The limbs have been cut from the felled trees at the trunk and carried off. To cut some of them the animals had to climb along the trunk to a position 10 to 15 feet above the ground. There are numerous beaver slides in the vicinity of the dam, and these are well worn and cleanly brushed by the leafy boughs that have been dragged down them.

September 4, 1884, Fort Verde, Arizona.—To-day I shot a young male beaver. Its stomach was nearly filled with the bark of the cottonwood. We had this young beaver served on our table, and all who partook of it pronounced it to be excellent meat.

September 12, 1884, Fort Verde, Arizona.—One young beaver was seen swimming in the Verde River with only the nose and fore part of the head out of water. It climbed out upon the opposite river bank, where I obtained a good view of it.

October 17, 1884, Gila River at the San Carlos Indian Agency.—Beavers are abundant. I saw many cottonwoods cut down or gnawed by them.

October 25, 1884, Fossil Creek, Arizona.—Beavers are numerous on this stream. While on this expedition (with General Crook) I saw fresh signs of the beaver on White River, the Gila, Salt River, and Tonto Creek, and old signs on Pine Creek, all in Arizona.

January 17, 1885, Indian Garden, Oak Creek, Arizona.—Beavers have cut many small saplings, but no large trees, along this stream.

May 13, 1885, Gila and Salt rivers, near Phoenix, Arizona.—Tracks and cuttings of the beaver were seen.

June, 1885, Fort Verde, Arizona.—Early in June, when fishing for bonytail (*Gila*) on a sluice of the Verde River, I accidentally stumbled upon a nest containing three young beavers, two of which I took for specimens on another occasion (June 13). The nest was contained in a hollow of the large decayed bole of ash trees that grew out of a common base, and was composed of stalks and leaves of sedge, tule, and herbs, together with some dry leaves and fine rootlets that had been washed bare by the stream. On this neat and soft bed were the three little ones. The mother dived into the pool which had undermined the trees along the jutting bank, but soon came back to look after her progeny and was quite bold. On subsequent visits to this nest I heard the splash of the parent when I approached the spot, and the progeny followed her example as soon as I reached them. The mother did not appear, but the young ones swam freely around the pool in my presence.

June 19, 1885, Fossil Creek, Arizona.—Beavers were seen in Fossil Creek, central Arizona.

October 1, 1885, Fort Verde, Arizona.—Being desirous of obtaining a handsome section of a cottonwood tree bearing the marks of the beaver's teeth, I selected an immense one which the beavers had cut two-thirds through, and which exhibited well the marks of their teeth and their apparent intention and ability to fell a tree in a particular direction. Colonel Clendennin, commanding the post, kindly allowed me to take a large crosscut, double-handed saw and the provost sergeant with two men. The tree proved to be larger than I had supposed, and we were unable to saw it down. As a good deal of heavy cottonwood timber had been cut by beavers in that vicinity, I measured the circumference of the trunks of six of the larger trees. The measurements, taken above the cutting, were as follows: 31½ inches, 21½, 55½, 36, 87½, and 89. One or two of the trees measured were still standing nearly cut through, but these were felled by the beavers soon after and carried away by them, with the exception of the heaviest trunks from which all the branches were gnawed.

November 7, 1885.—A prospector related a story of a fight between a beaver and mountain lion. The miner, encamped on the Colorado River at a point where there was a broad sand flat, saw a beaver in the early morning crossing the sand flat to a strip of cottonwood timber, whence it was afterwards seen dragging a stick of wood back toward the water. A mountain lion was then seen crouched in the trail watching, ready to intercept the beaver. As the latter approached the lion sprang upon it, and the two animals closed in a desperate conflict. The fortunes of war wavered, now on the side of the lion, anon on that of the beaver. The miner, taking his rifle in hand, cautiously approached the combatants and watched them from a place of concealment. After fighting a long time the beaver was left dead on the field and the lion attempted to crawl from the spot, followed by the prospector, who found it unnecessary to kill the lion with his rifle, as it soon lay down upon the sand and died from exhaustion and loss of blood.

January 22, 1886, Fort Verde, Arizona.—During the past week there have been long heavy rains. The rainfall in the valley amounted to several inches, while upon Grief Hill, 1,500 feet higher (altitude about 5,000 feet), the precipitation amounted to 5 inches. The Verde River overflowed its banks and flooded the beavers out from their burrows in the river banks. For a night or two they were seen all along the river, showing great excitement, and several of them were shot.

March 26, 1886, Fort Verde, Arizona.—A few days ago a female mallard flew from a beaver-felled cottonwood whose branches drooped into the water beyond a pile of driftwood. As I had been within a few feet of the spot for a quarter of an hour without noticing the duck, I suspected that it had a nest among the driftage. To-day,

with a view to discovering the mallard's nest, I stopped and scrutinized the spot with particular care from the opposite bank of the stream, and descried a huge beaver seated upon the tree trunk beneath the débris. It had evidently been driven from its home by the very high water of the rising stream, and had sought concealment in this shady spot. When I revisited the place later in the day the beaver had returned, but only its head was out of water, and that so nearly concealed by brushwood that I caught sight of it too late for a shot. When first seen I could easily have obtained the specimen had my gun been loaded for such tough game; but it had gone before exchange of cartridges could be effected.

May 28, 1886, Fort Verde, Arizona.—Hoy, the driver of the post water wagon, brought me a large female beaver that he killed with a stone under the bank of Beaver Creek. The soldier's dog caught one of this beaver's young, which Hoy also brought to me (Nos. 6785 and 2339, coll. Amer. Mus. Nat. Hist.).

June 11, 1886, Fort Verde, Arizona.—To-day I saw a place where the beavers' castoreum had been deposited. The ground was stained blackish, and the odor was so strong as to attract my attention when riding near.

February 10, 1887, Fort Verde, Arizona.—A beaver was caught in a steel trap eight days ago, and left one fore foot in the trap. To-day it was found stranded upon a low sand island, having but recently died. The uterus contained three fetuses about 25 mm. in length. They were contained in spherical sacs as large as a hen's egg. The placenta was four times larger than the embryo, which latter had developed largely to head and hind extremities. The weight of the other was 46 pounds; eye 9.5 mm. in diameter.

March 15, 1887, Verde River, Arizona.—I saw a beaver come out of its burrow in the bank and drag a cottonwood branch into its home in broad daylight.

March 27, 1887, Fort Verde, Arizona.—I have noticed that beavers have been working on ash trees in several localities in this region of late.

April 3, 1887, Box Canyon of the Verde River.—Beavers are numerous, and have cut much of the timber along the river bank. Mr. J. P. Milligan took 120 beavers on the Gila and Verde rivers during the winter of 1886–87, and sold the skins at $2.50 a pound (about $5 apiece).

November 22 to 24, 1887.—On the East Verde River are several fine beaver dams. One of them is 4 feet high, and could not have been better built by man. This dam is superior to any other that I have seen in the region. Beavers are very plentiful on the East Verde.

I found bones of the beaver in many cliff and cave dwellings of the extinct race of man known as cliff dwellers in the Verde Valley, Arizona, from 1884 to 1888.

The dens of beavers are usually dug in the bluff banks of streams, and have the entrance at a considerable depth below the surface of the water. At the back part are usually one or more openings, probably for the purpose of admitting the air, which are concealed by brush and weeds. At Fort Verde a beaver den was partially opened, and a bulldog that had earned the reputation of being a hard fighter was admitted. In the fight that ensued the dog was badly beaten, and could not again be induced to attack a beaver.

Mr. Stuart Daniels found beavers on the Sonora River, Mexico. He also found them in abundance on the Gila River, Arizona. On the Boundary Survey they were found on the San Pedro River and on Babocomeri Creek, one of its tributaries in Arizona. Two trappers whom we met at Yuma, Arizona, in March, 1894, had recently arrived from a 200-mile trapping expedition down the Gila River. They had shipped a number of beaver and raccoon skins taken during this trip, but found no beavers on the lower portion of the Gila. I saw old beaver cuttings on the Gila in the vicinity of Adonde Siding, Arizona, in February, 1894. Residents said that there had been scarcely any beavers on the lower Gila since the flood of February, 1891, which washed them all out. One man told me that beavers were then (February, 1894) working extensively at Mohawk, on the Gila. Beavers were formerly found at Gila City, but had been driven out by previous floods. In the years 1893 and 1894 a colony of beavers was located about 12 miles below Yuma, on a lagoon of the Colorado River. Seven of them were trapped by Mr. Smart, of our party. Beavers are common on the Colorado, and doubtless sometimes ascend the Salton and New river lagoons of the Colorado Desert during seasons of overflowing; but we saw no signs of them at the time of our visit away from the Colorado River in that region.

No signs of beavers were seen by us on Cajon Bonito Creek or the San Bernardino River, terminals of the Yaqui River; but Mr. Hall, who resided in the Guadalupe Canyon, informed me in 1892 that he had seen their cuttings lower down on Cajon Creek; but I failed to discover them there.

Comparative cranial measurements of 27 specimens of beavers.

Museum number of skull.	Locality.	Sex and age.	Condylo-basal length.	Basilar length.	Length of nasals.	Greatest width of nasals.	Interorbital breadth.	Greatest width of skull.	From front of intermaxillaries to lateral teeth.	Palatal length.	From posterior border of palate to foramen magnum.	Maxillary tooth row.	Greatest length of mandible.	Height of mandible from angle to apex of coronoid process.
			mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
2045a	Verde River, Arizona	♂ ad.	138	122	47	25	23	102	57.0	79.0	43	30.0	115	61.0
2029a	....do	♂ ad.	140	125	48	26	26	100	58.0	90.0	44	32.0	116	59.3
5131a	....do	♂ ad.	141	123	53	27	24	101	59.0	92.0	43	32.0	120	60.6
2047a	....do	♂ ad.	139	122	50	25	23	97	56.0	86.0	45	31.4	114	63.0
2028a	....do	♂ ad.	135	119	46	24	25	97	56.0	87.0	41	31.0	112	59.0
2052a	....do	♂ ad.	138	122	50	27	24	97	55.0	86.0	44	31.2	112	56.0
35883	San Pedro River, Sonora, Mexico[b]	♂ ad.	133	117	47	25	23	99	55.1	84.6	40	31.0	108	54.5
60354	Colorado River, Arizona	♂ ad.	134	119	48	25	23	97	54.4	81.0	40	32.2	.....	.....
2033a	Verde River, Arizona	♀ ad.	135	119	47	25	22	95	54.2	85.0	42	30.5	109	56.0
2035a	....do	♀ ad.	127	111	44	23	22	92	51.0	80.0	38	29.0	104	54.0
2046a	....do	♀ ad.	131	115	48	25	22	94	54.0	83.0	41	29.0	107	55.0
2030a	....do	♀ ad.	128	112	48	24	23	92	53.0	82.0	41	29.0	106	54.0
2031a	....do	♀ ad.	137	123	49	24	22	100	57.0	79.0	44	31.0	113	59.0
2043a	....do	♀ ad.	136	120	50	25	24	101	55.0	72.0	43	31.0	112	57.0
2032a	....do	♀ ad.	133	116	46	24	24	96	54.0	75.0	40	30.2	107	54.0
35946	San Pedro River, Sonora, Mexico	♀ ad.	126	111	45	22	22	94	51.2	80.2	39	29.2	104	56.0
4347	Fort Simpson, Hudsons Bay territory	.....	120	105	42	22	23	86	49.0	71.0	35	28.0	99	50.0
4292	....do	♂ ad.	120	106	41	21	22	84	47.0	70.0	36	28.0	95	50.0
4204	....do	.....	116	102	40	20	22	81	45.0	66.0	34	28.0	92	47.0
3280	Nelson River, Hudsons Bay territory	.....	116	102	40	23	22	87	46.0	66.0	34	27.5	97	51.0

7194	Fort Good Hope, Hudsons Bay territory	♂ ad.	120	106	41	21	21	85	47.0	68.0	38	28.0	98	51.0
7195	.....do	♂ ad.	122	108	43	22	21	85	51.0	71.0	37	28.0	96	48.0
7392	Lake Superior		123	107	43	22	24	88	50.0	71.0	35	29.0	101	54.0
7389	.....do		126	111	44	21	23	89	53.0	76.0	39	29.0	102	55.0
20894	Genito, Virginia		133	117	47	23	26	94	55.0	78.0	40	32.0	107	57.0
3772	Franklin County, Mississippi		134	118	48	24	24	99	54.0	76.0	43	32.0	110	58.0
6564	River Elbe, Germany		125	105	51	23	25	83	50.0	70.0	35	30.0	97	51.0
Average of 8 males from Arizona and Sonora			137	121	49	26	24	99	56.3	85.7	42	31.4	114	59.1
Average of 8 females from Arizona and Sonora			132	116	47	24	23	96	53.7	80.0	41	29.9	108	55.6
Total average of 16 from Arizona and Sonora			134	119	48	25	24	98	55.0	82.9	42	30.7	111	57.4
Average of 10 adults from Canada and the eastern United States			123	108	43	22	23	88	49.7	71.3	37	29.0	100	52.4

[a] American Museum of Natural History.

[b] Type of *C. c. frondator*.

Measurements of 13 specimens of Castor canadensis frondator.[a]

Museum number.		Collector's number.	Locality.	Date.	Sex and age.	Total length.	Length of tail, measured from anus.	Greatest width.	Ear, height above crown.	Length of manus and claw.	Length of pes with claw.	Weight, pounds avoirdupois.
Skin.	Skull.											
				1884.		*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*
3336	1854	120	Verde River, at Fort Verde, Arizona.	Aug. 16	♂ ad.	1,120	360	125	40	73	143	61
	2055?	122	.....do.....	Aug. 19	♀ juv.	630	224	63	30	52	99	....
3337	2054?	123	.....do.....	Sept. 10	♂ juv.	750	253	77	32	57	99	....
				1885.								
3338	.....	198	.....do.....	June 13	♀ juv.	387	122	36	17	41	81	....
(?)	2038	199	.....do.....	....do...	♂ juv.	390	127	32	17	41	78	....
	5131	262	.....do.....	Oct. 14	♂ ad.	1,130	365	150	27	83	182	64
	2037	265	.....do.....	Oct. 17	♂ juv.	800	280	88	29	68	150	....
				1886.								
6785?	53947	406	Beaver Creek, near Fort Verde, Arizona.	May 28	♀ ad.	1,080	365	155	35	85	185	42
2339	.....	407	.....do.....	....do...	♂ juv.	340	97	.....	.....	.....	.....	.....
				1887.								
	2057	515	Verde River, at Fort Verde, Arizona.	Feb. 10	♀ ad.	1,132	385	153	35	85	182	46
	2036?	522	.....do.....	Feb. 21	♂ juv.	963	318	114	34	76	168	....
20751	35946	2118	San Pedro River, Sonora, Mexico.	1892.....	♀ ad.	950	334	127	25	84	176	32
20750	35883	2151	.....do.[b].....	1892.....	♂ ad.	1,070	360	125	31	82	185	62

[a] All but the last two specimens are in the collection of the American Museum of Natural History.
[b] Type.

Family MURIDÆ.

RATS AND MICE.

Dentition.—I. $\frac{1-1}{1-1}$; C. $\frac{0-0}{0-0}$; P. $\frac{0-0}{0-0}$; M. $\frac{3-3}{3-3}=16$.

Skull with contracted frontals; a short and slender jugal, generally reduced to a splint between the zygomatic processes of the maxilla and squamosal; the lower root of the former process more or less flattened into a perpendicular plate; typically, the infraorbital vacuity tall, and wide above and narrow below. Lower incisors compressed; no premolars; molars rooted, or rootless, tuberculate, or with angular enamel-folds. Pollex rudimental; tail generally nearly naked and scaly. (*Flower and Lydekker.*)