

BULLETIN
OF THE
American Museum of Natural
History.

Vol. XVI, 1902.

NEW YORK:

Published by order of the Trustees.

1902.

PUBLICATIONS OF THE American Museum of Natural History

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Art. I, Jan. 16; Art. II, Feb. 1; Art. III, Feb. 6; Art. IV, Feb. 5; Art. V, Feb. 5; Art. VI, Feb. 5; Art. VII, Feb. 3; Art. VIII, Feb. 18; Art. IX, March 15; Art. X, March 31; Art. XI, April 7; Art. XII, April 7; Art. XIII, April 12; Art. XIV, April 23; Art. XV, April 16; Art. XVI, July 1; Art. XVII, June 28; Art. XVIII, July 12; Art. XIX, Aug. 18; Art. XX, Aug. 18; Art. XXI, Sept. 18; Art. XXII, Sept. 25; Art. XXIII, Sept. 25; Art. XXIV, Sept. 25; Art. XXV, Sept. 25; Art. XXVI, Oct. 11; Art. XXVII, Oct. 11; Art. XXVIII, Oct. 11; Art. XXIX, Oct. 11; Art. XXX, Nov. 3; Art. XXXI, Nov. 3; Art. XXXII, Oct. 31; Art. XXXIII, Dec. 20; Art. XXXIV, Dec. 12.

The edition of separates from the present volume was 350, of which 100 were for the authors, and 250 for the Library exchange list and for sale. Of Art. XXVI, by Dr. Hovey, 225 separates were published in addition to the usual number.

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BULLETIN

OF THE

AMERICAN MUSEUM OF NATURAL HISTORY.

VOLUME XVI, 1902.

Article I.—A NEW SPECIES OF ELK FROM ARIZONA.

By E. W. NELSON.

The Arizona Elk, the last of the large game mammals of America to become known to science, is already on the verge of extinction. So far as I have been able to learn, its range has been long isolated and in an area where the idea of game protection is very recent, and where even now the protection afforded by the game laws (owing to the remote situation) is more nominal than real. The present game law of Arizona prohibits the shooting of elk at all seasons, and it is to be hoped that an effort may be made to render this protection effectual.

The only specimens of this species now known are the two obtained by myself near the head of Black River in the White Mountains of Arizona. The type is in the National Museum and the other specimen, represented by the skull and antlers of an old male, is in the American Museum of Natural History. The skull of the American Museum specimen is described and figured in this paper, owing to the temporary mislaying of the skull of the type.

I have found no published record of this species among earlier authors and the actual extent of its former range will be difficult to determine. My first knowledge of its existence was obtained in the fall of 1882, when some prospectors at Chloride, New Mexico, told me that elk inhabited the Mogollon Mountains near the extreme headwaters of Gila River. Nothing further was heard of it until the early months of 1884,

[January, 1902.]

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when I spent some time exploring the Indian ruins about the village now called Frisco, on the headwaters of the San

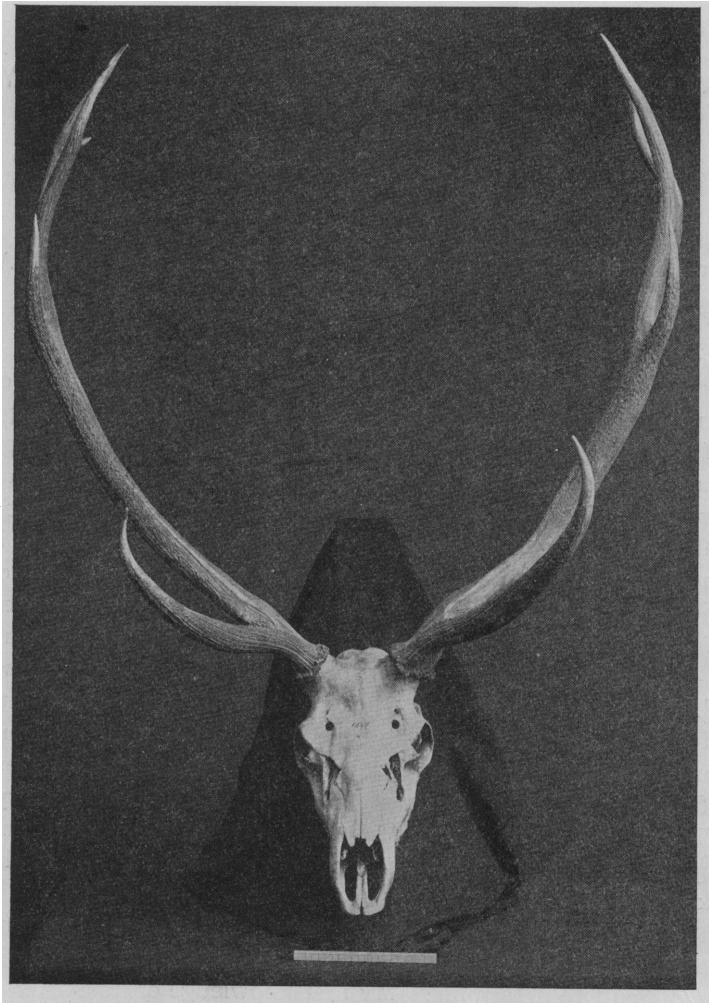


Fig. 1. *Cervus merriami*, ♂ ad. No. 16211, Am. Mus. Nat. Hist., near Springerville, Arizona. Topotype.

Francisco River in western Socorro County, New Mexico. During January I made a horseback trip about ten miles to the

eastward into the border of the Mogollon Mountains and saw a doe elk and two young bucks hanging by a hunter's cabin. At this time elk were reported to be not uncommon on the higher parts of the range, but the total number, from all

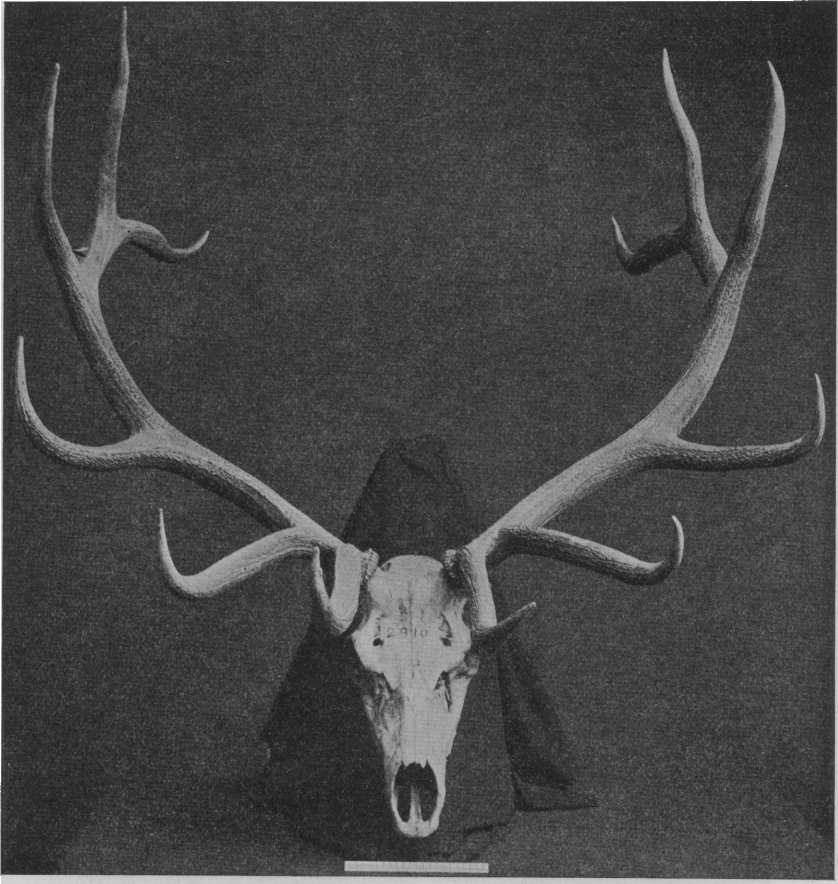


Fig. 2. *Cervus canadensis*, ♂ ad. No. 2910, U. S. Nat. Mus., Fort Berthold, North Dakota.

accounts, must have been very small compared with those then found in Colorado and farther north.

From 1885 to 1887, while living on my ranch at the eastern base of the White Mountains, near Springerville, Arizona, I

heard frequently of elk living in the higher and more remote

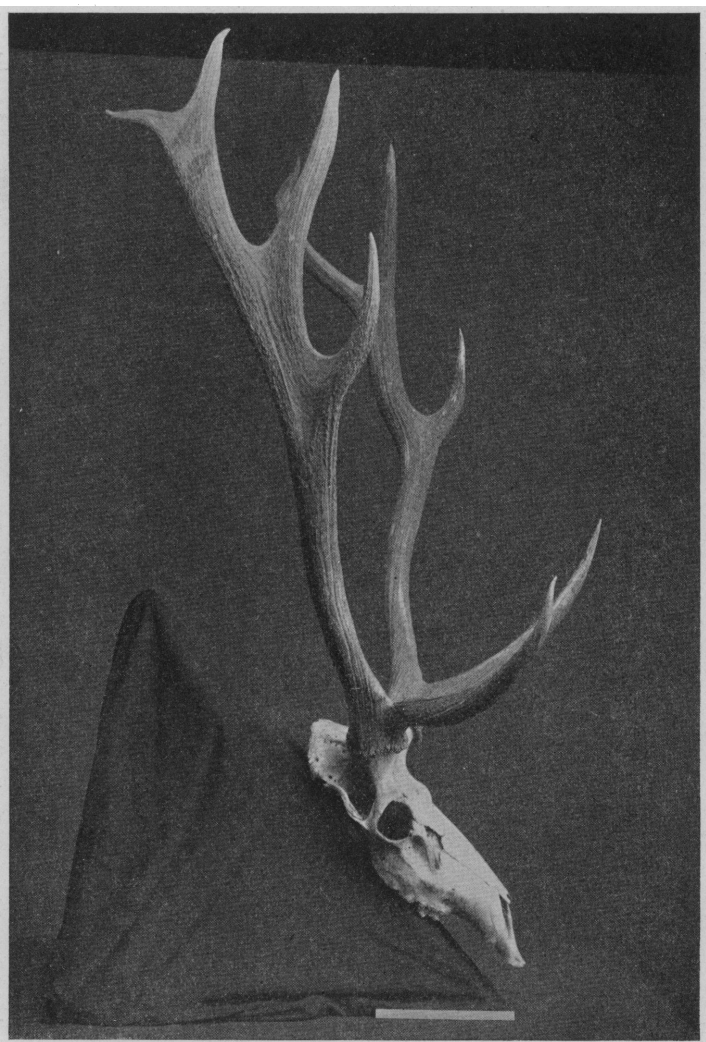


Fig. 3. *Cervus merriami*, ♂ ad. Same specimen as Fig. 1.

parts of these mountains, mainly along the border of the White Mountain Indian Reservation, near the head of Black

River (a tributary of the Gila). The local hunters reported them as not uncommon in this area where, during brief hunting

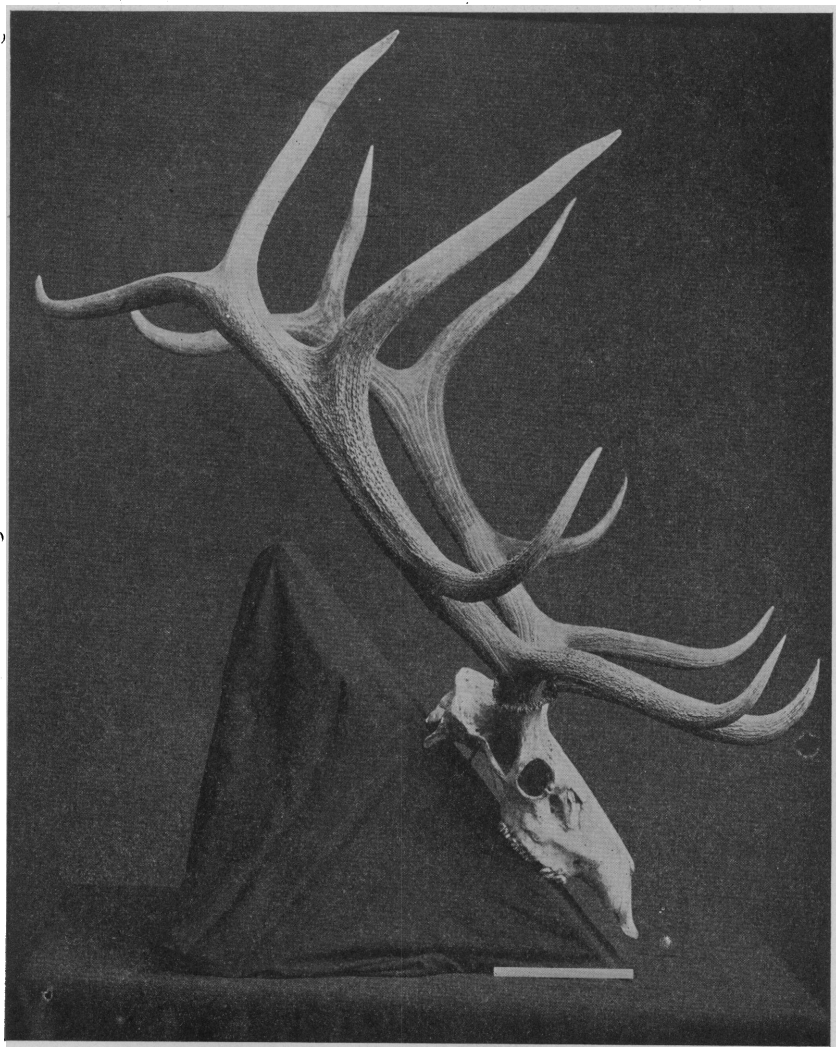


Fig. 4. *Cervus canadensis*, ♂ ad. Same specimen as Fig. 2.

trips between 1885 and 1888, I saw signs of their presence in various places. Their main range covered an area about 30

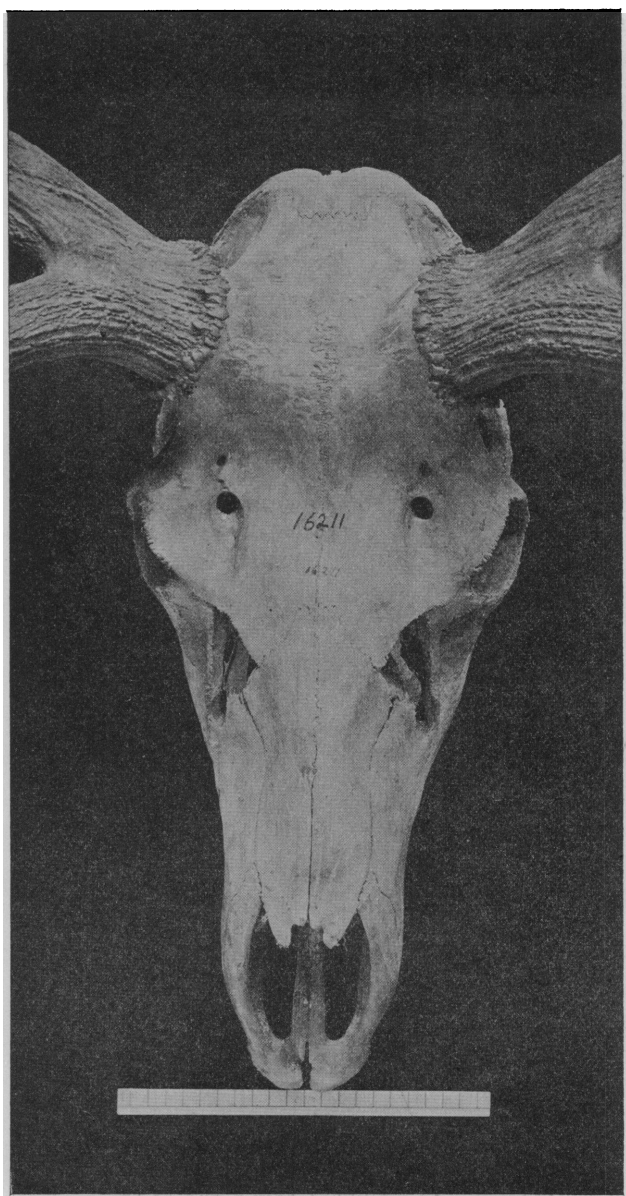


Fig. 5. *Cervus merriami*, ♂ ad. Same specimen as Figs. 1 and 3.

by 50 miles in extent, at an elevation from 8000 to 10,000 feet above sea level. This country forms the divide between the headwaters of the Little Colorado River and Black River and the high Prieto Plateau between the upper Black River and Blue River. At the time of which I write elk were far from numerous, but I never visited their territory without seeing signs, usually more or less recent tracks, and in fall the broken branches and barkless trunks of saplings, where the bulls had been rubbing their horns. The most abundant signs were found about some beautiful damp meadows in the midst of the dense fir forest on the rolling summit of the Prieto Plateau, between the Blue and the Black Rivers. Owing to the presence of hostile Apaches at that time, it was dangerous to linger in the country where we saw most of the elk signs, so we always pressed on to a safer district before doing much hunting. Outside the Indian country they were not common enough for one to hunt them with any degree of certainty. From 1884 to 1889 the white hunters did not kill a dozen elk in all this district.

Mr. W. W. Price, who made a collecting trip for mammals through the White Mountains during July and August, 1894, states: "So far as we could learn this animal is now confined to a small area in the higher White Mountains. Several were seen and a fine male was shot at about 9000 feet elevation on August 10. They feed in the dense fir woods and glades which clothe the upper slopes of the mountains." (Bull. Am. Mus. Nat. Hist., Vol. VII, 1895, pp. 257, 258.) A recent letter from my brother, Mr. F. W. Nelson, informs me that a local hunter found the trail of a bull elk near the head of Black River the present autumn (1901), and followed it for two days without obtaining a shot at the animal. This shows that the Arizona Elk still survives, and that it is pursued by local hunters regardless of the legal prohibition.

***Cervus merriami*, new species.**

Type, No. 111639, ♂ ad., U. S. National Museum, collected August, 1886, at head of Black River, White Mountains, Arizona, by E. W. Nelson.

Distribution.—Formerly all of the higher parts of the White Mountains of Arizona and the Mogollon Mountains of western New Mexico.

Now nearly extinct and limited to a small area in higher parts of the White Mountains (and possibly in the Mogollons).

General characters. —

Nose darker and head and legs more reddish than *Cervus canadensis* from the northern Rocky Mountains, but paler than *C. roosevelti* Merriam, of the Northwest Coast region. Skull more massive with nasals broader and much more flattened, and upper molar series heavier and more curved. Antlers most like those of *C. canadensis* but with tip straighter, thus giving much longer chord from base to tip.

Summer pelage (type specimen).—Top of nose rich reddish chestnut brown becoming much paler and more yellowish along edges of upper lips; and paler, more reddish fulvous on cheeks, forehead, and crown; pale areas around eyes dull dark buffy; chin dingy buffy with large blackish brown spot on each side; front of ears pale buffy yellow; back of ears reddish brown; top of neck, body faded grizzled yellowish brown, darkest along middle of back and shading into pale dingy yellowish on flanks; rump patch dingy yellowish white (not

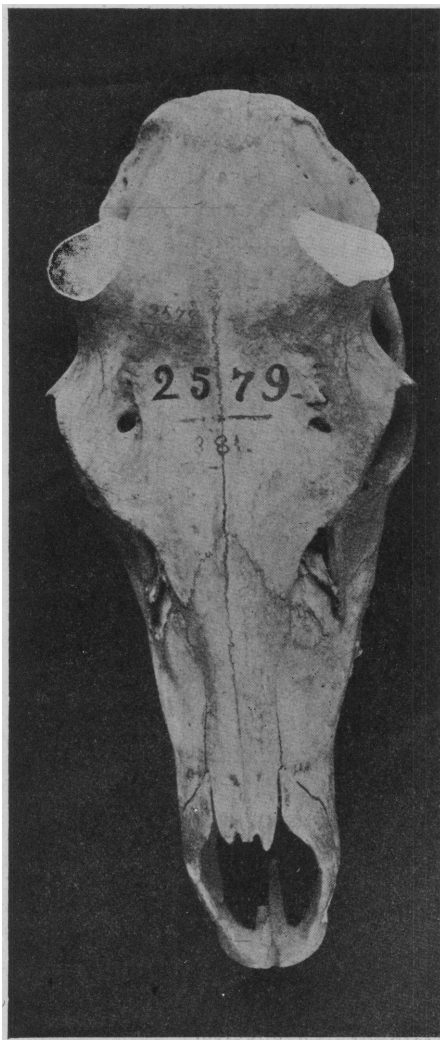


Fig. 6. *Cervus canadensis*, ♂ ad. No. 2579. U. S. Nat. Mus., North Dakota.

strongly contrasting with rest of back) bordered along lower edge by narrow band of seal brown; underside of neck and body dark brown, darkest on neck and more reddish on belly; front of forelegs dark reddish brown becoming paler (nearly vandyke brown) on sides and with median line behind and around borders of hoofs reddish fulvous; hind legs similarly colored but paler along front.¹

*Winter pelage.*²—

"Body, above and on sides, pale yellowish brown, this color extending over entire outer surfaces of shoulders and hips and over all of buttocks and tail. Head and neck seal brown with] pale areas around commisure and eyes; ears whitish at base and

¹While dressing this skin the taxidermists of the National Museum found three bullets encysted in the thick hide about the neck and shoulders. One appears to be from a Springfield musket and the others from 44 cal. Winchester rifles.

²Dr. E. A. Mearns, U.S.A., has kindly given me the accompanying description of the winter pelage of *Cervus merriami*, taken from the skin of No. 16211, American Museum of Natural History. This specimen was secured by me in the White Mountains the fall of 1887 and passed into the hands of Dr. Mearns, who afterwards presented it to the American Museum of Natural History. Fortunately, Dr. Mearns entered a brief description of the pelage in his note book at the time, as the skin has since been accidentally destroyed.

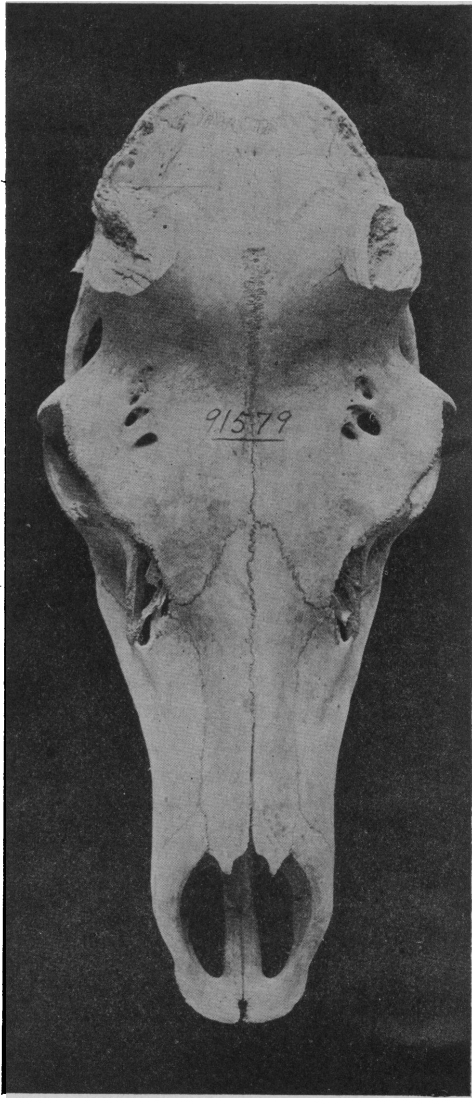


Fig. 7. *Cervus roosevelti*, ♂ ad. Olympic Mountains, Wash. Type.

liver brown on posterior surfaces. Sides of neck paler than underside of head and neck—the hairs being dark brown at base with broad fulvous tips and brown annulations. Under surface of body, with inner and posterior surfaces of legs dark seal brown, a band of same color extending upward and outward from inside of thighs toward hip joint. Front and outside of legs cinnamon rufous, varying to fulvous. Hoofs black with fringe of buff colored hairs at base."

Skull.—*Cervus merriami* has strongly marked skull characters. It differs strikingly from both *Cervus canadensis*, of the northern Rocky Mountains, and from *Cervus roosevelti*, of the Northwest Coast, in having the nasals remarkably broad and flattened; the palate narrow between the posterior molars and in the great zygomatic breadth and massive molars.

The skull, compared more in detail with that of *Cervus canadensis* (from Nebraska and North Dakota), has the facial region anteriorly to the zygomatic arch broader and more massive and the premaxillaries heavier and more strongly convex laterally, forming a broad, heavy muzzle; the nasals have a convex outline along the outer borders, giving them a somewhat lyre-shaped form, and are very broad and greatly flattened throughout their length, completely lacking the lateral compression near the posterior end which gives the top of the nose in *C. canadensis* a narrower, more ridge-like form. The interorbital and zygomatic breadths are greater but the parietal breadth is about the same. Owing to the approximation posteriorly of the upper molar series, the hinder part of the palate is narrow, especially between the last two molars. The upper molar series are more curved and the teeth broader and heavier.

Compared with *C. roosevelti* the skull of *C. merriami* differs in much the same way as it does from *C. canadensis* (from the region mentioned), but there are certain details which are not the same. The table of measurements indicates an even greater width of nasals for *C. roosevelti*, but this is more apparent than real, for the width measured near the posterior end of the nasals merely shows a considerable lateral expansion of the bony angles, and they become decidedly narrower anteriorly and have the same lateral compression along the basal part of the ridge as in *C. canadensis*. The skulls of *C. mer-*

riami and *C. roosevelti* anteriorly to the orbits are of nearly equal breadth, but *C. merriami* has greater zygomatic and parietal breadth. The palate of *C. merriami* is strikingly narrower posteriorly than *C. roosevelti*, the width of the palate of the latter even exceeding that in *C. canadensis*. The molar series are of about equal length, but are more curved and the teeth are more massive in *C. merriami*.

The following tables of measurements of skulls, teeth and antlers show comparative details of size in adult males of *Cervus merriami*, *Cervus roosevelti*, and *Cervus canadensis*.

In conclusion, I wish to acknowledge my indebtedness to Dr. J. A. Allen, Curator of Mammals of the American Museum of Natural History, for the loan of the only skull of *Cervus merriami* now available, and to the authorities of the U. S. National Museum for the use of material and for the series of photographs of skulls for illustrating this paper. My thanks are especially due to Mr. Gerrit S. Miller, Jr., Assistant Curator of Mammals, and Mr. Geo. B. Turner, taxidermist, of the National Museum, for favors received while studying the material.

COMPARATIVE MEASUREMENTS OF SKULLS of *Cervus merriami*, *Cervus roosevelti*, AND *Cervus canadensis*.

COMPARATIVE SKULL MEASUREMENTS. (All adult males.)	Occiput to front of premaxilla.	Palatal length.	Length of nasals.	Greatest breadth of nasals.	Greatest orbital breadth.	Greatest breadth across premaxilla.	Breadth across parietals.	Zygomatic breadth.	Breadth below lacrimal fossæ.
<i>Cervus merriami</i> , near Springerville, Ariz., No. 16211 Am. Mus. Nat. His- tory (Topotype).....	498	288	183	83	194	99	168	203	157
<i>Cervus roosevelti</i> , Olympic Mts., Wash- ington, No. 91579 U. S. N. M., Bio- logical Survey. (Type)	516	297	192	84	195	98	163	190	150
<i>Cervus canadensis</i> , Ft. Berthold, N.Dak., No. 2910 U. S. N. M.	500	288	172	70	185	89	170	186	156
<i>Cervus canadensis</i> , Republican Fork, Neb., No. 49402 U. S. N. M.	492	292	172	65	174	86	156	180	150

MEASUREMENTS OF UPPER MOLAR SERIES. (All adult males.)	Total length of row.	Distance between alveoli.						Breadth of 2d M. at base.
		1st P. M.	2d P. M.	3d P. M.	1st M.	2d M.	3d M.	
<i>Cervus merriami</i> , No. 16211 Am. Mus. Nat. Hist.	137	59	63	75	77	76	69	31
<i>Cervus roosevelti</i> , No. 91579 U. S. N. M.	138	65	69	73	82	82	80	29
<i>Cervus canadensis</i> , No. 2910 U. S. N. M.	137	58	70	76	80	79	77	29
<i>Cervus canadensis</i> , No. 49402 U. S. N. M.	128	58	70	77	80	78	76	27
<i>Cervus canadensis</i> , No. 2903 U. S. N. M., Ft. Berthold, N. Dak.	—	60	67	76	78	77	77	—

MEASUREMENTS OF ANTLERS.	Chord from burr to tip.	Distance along outside of curve.	Circumference above burr.	Spread at tip.
<i>Cervus merriami</i> , No. 111639 U. S. N. M. (Type)	1192	1410	2687	—
<i>Cervus merriami</i> , No. 16211 Am. Mus. Nat. Hist. (Topotype)	1067	1240	237	843
<i>Cervus roosevelti</i> , No. 91579 U. S. N. M. (Type)	980	1075	280	990
<i>Cervus canadensis</i> , Ft. Berthold, N. Dak., No. 2910 U. S. N. M.	926	1290	252	760
<i>Cervus canadensis</i> , Republican Fork, Neb., No. 49402 U. S. N. M.	820	915	183	770