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PRELIMINARY REVISION OF THE NORTH AMERICAN RED FOXES.

[Plates XXXVI-XXXVII.]

By C. Hart Merriam.

WASHINGTON, D. C.
Published by the Academy
1900.
PRELIMINARY REVISION OF THE NORTH AMERICAN RED FOXES.

By C. HART MERRIAM.

[PLATES XXXVI-XXXVII.]

The specimens necessary for a final revision of the North American Red Foxes do not exist in any museum. Nevertheless the collections of the U. S. Biological Survey and National Museum show that several well-marked forms have escaped description, and furnish material for a preliminary study of the group.

For many years it has been customary to refer all our red foxes, with the single exception of specimens from the far west, to *Vulpes fulva* Desmarest; and some naturalists have considered this animal the same as *Vulpes vulpes* of northern Europe and Siberia. Outram Bangs, in a paper published in the Proceedings of the Biological Society of Washington in March 1897 (vol. xi, pp. 53–55), stated that the American species is quite distinct from the European and pointed out the characters by which either may be distinguished from the other; at the same time he described a new fox from Nova Scotia, which he named *Vulpes pennsylvanicus vafra*. A year later Mr. Bangs described another species, from Newfoundland, which he named *Vulpes deletrix*.

Haird, in the Report of Stansbury's Expedition to Great Salt Lake, published in May or June 1852, described a cross-fox from Utah under the name *Vulpes macrurus*, to which

1 This name being preoccupied, Mr. Bangs renamed the form *rubricosa*. Science, NS., vii, pp. 271–272, Feb. 25, 1898.


specimens from all parts of the far west have been usually referred. Additional specimens from the type locality are not at hand; hence I have been obliged to characterize the species from specimens collected in other parts of the Rocky Mountains—from Colorado and Wyoming. Comparison of the scanty material available from the Rocky Mountain region with corresponding specimens from the Great Plains, the Cascade Range in Oregon and Washington, and the High Sierra in California, has led me to recognize as distinct three additional species, heretofore confounded under macrourus.

Of the Alaska red foxes little is known and only one species has been described—the large Kadiak Island species, *Vulpes harrimanii*, recently published by me in these Proceedings.\(^1\) Two others from Alaska, one from British Columbia, and one from Labrador are here added to our fauna.

Mr. Bangs has kindly loaned me his types and other specimens from Labrador, Newfoundland, and Nova Scotia, thus enabling me to compare these forms directly with those from Alaska and the northern United States. Good skins with skulls are still needed from various parts of Alaska, the Rocky Mountain region, and the southern United States.

As a result of the present study, twelve species and subspecies are recognized. These, with their type localities, are:

<table>
<thead>
<tr>
<th><em>Vulpes fulvus</em> Desmarest</th>
<th>Virginia.</th>
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<tbody>
<tr>
<td>macrourus Baird</td>
<td>Wasatch Mountains, Utah.</td>
</tr>
<tr>
<td>necator sp. nov.</td>
<td>Southern High Sierra, Calif.</td>
</tr>
<tr>
<td>cascadensis sp. nov.</td>
<td>Mt. Adams, Washington.</td>
</tr>
<tr>
<td>rubricosa Bangs</td>
<td>Nova Scotia.</td>
</tr>
<tr>
<td>rubricosa bangsi subsp. nov.</td>
<td>Labrador.</td>
</tr>
<tr>
<td>deletrix Bangs</td>
<td>Newfoundland.</td>
</tr>
<tr>
<td>alascensis sp. nov.</td>
<td>Lower Yukon, Alaska.</td>
</tr>
<tr>
<td>alascensis abietorum subsp. nov.</td>
<td>Stuart Lake, British Columbia.</td>
</tr>
<tr>
<td>kenaiensis sp. nov.</td>
<td>Kenai Peninsula, Alaska.</td>
</tr>
<tr>
<td>harrimanii Merriam</td>
<td>Kadiak Island, Alaska.</td>
</tr>
<tr>
<td>regalis sp. nov.</td>
<td>Elk River, Minn.</td>
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Of these, the last three (*regalis, harrimanii*, and *kenaiensis*) are very large—probably double the bulk of the common eastern red fox; *abietorum* is only slightly smaller; *alascensis* is still slightly smaller and hardly larger than *deletrix, rubricosa*,

and bangsi; then comes macrourus, and finally the smallest members of the group, cascadensis, necator, and fulvus.

In the large species (regalis, harrinani, and kenaiensis) the males are enormously larger than the females; in the smaller species the sexual disparity in size is much less pronounced.

VULPES FULVUS (Desmarest).

Pl. XXXVII, fig. 1.

Conis fulvus Desmarest, Mammalogie, i, pp. 203-204, 1820.

_Type_ locality.—Virginia.

_Range._—Northeastern United States.

_Characters._—Size small; face small and sharp; tail terete and rather small; black of fore and hind feet extensive and reaching far up on legs.

_Color._—Face rusty fulvous, profusely grizzled with whitish; upperparts bright golden fulvous, varying to fulvous, darkest along middle of back; hinder part of back slightly grizzled with whitish; chin, throat, and band down belly white; black of forefeet spreading over whole foot and reaching up broadly to elbow; black of hind feet reaching up in narrow band along outer side of thigh. Tail fulvous, profusely mixed with black hairs which are most abundant on distal half of under surface; a black spot near base of upper surface; tip white.

Compared with Vulpes vulpes of Sweden, V. fulvus is smaller; tail shorter and smaller; rusty of face paler and very much more profusely mixed with whitish [in vulpes the rusty is nearly pure]; black of fore and hind feet very much more extensive. In cranial characters the two are quit distinct, as shown under V. alascensis.

_Skull._—Small; face and rostrum small and slender; bullae smaller than in any other American species and sloping gradually (instead of rising abruptly) from basioccipital; basioccipital broad.

_Teeth._—Rather small; premolars well spaced; upper carnassial with anterointernal cusp moderately developed but not projecting strongly from plane of inner side of tooth; 1st upper molar smaller than in any described species.

_Measurements._—Average of 3 males from southern New England: total length 1034; tail vertebrae 394; hind foot 163.

VULPES MACROURUS Baird.

Pl. XXXVI, fig. 1.


**Type locality.**—[Wasatch Mts. bordering] Salt Lake Valley, Utah. Range.—Mountains of Colorado, Utah, and Wyoming.

Characters.—Size and general appearance of fulvus, but tail much longer; hind feet larger; black of feet and legs much less extensive.

Color. — Nose dull brownish fulvous, grizzled with buff; sides of face between nose and eyes dusky, grizzled with whitish; rest of face mixed buffy or buffy fulvous and whitish; back yellowish fulvous, darkest on median line, palest on sides of neck and flanks; outer sides of legs dark reddish fulvous; black of forefeet reaching up narrowly nearly to elbow; black of hind foot narrow and hardly reaching ankle. Tail grizzled grayish buff mixed with black hairs, the black hairs on upper side of base forming a broad blackish patch. Chin dusky; whitish of throat and breast darkened by underfur showing through.

Skull.—Similar to that of fulvus, but bullae much larger and rising abruptly from basioccipital; basioccipital narrower; carnassials slightly larger; 1st upper molar decidedly larger.

Measurements.—A young ♂ from Wind River Mts., Wyoming: total length 1015; tail vertebrae 451; hind foot 172.

**VULPES NECATOR** sp. nov. High Sierra Fox.

Pl. XXXVI, fig. 2.


Range.—Southern or High Sierra, California.

Characters.—A small fox of the fulvus group, resembling fulvus externally, but cranially most closely related to macrourus. Tail small as in fulvus (or smaller), differing widely from the big tail of macrourus.

Color.—Face dull fulvous, strongly grizzled with whitish; sides of nose dusky, grizzled with buffy; upperparts from back of head to base of tail dark dull rusty fulvous, becoming much paler on sides, where the whitish underfur shows through; black of forefoot reaching up on upper surface of foreleg to elbow; black of hind feet ending at or near tarsal joint, with only slight traces on outer side of leg; tail at base fulvous, becoming buffy whitish and profusely mixed with long black hairs; base with the usual black spot; tip white.

A male from Atwell’s Mill, East Fork Kaweah River, Tulare Co., California (alt. 6300 ft.), collected the last of March, is in the black-

1 From a male from Wind River Mts., Wyoming, August 28, 1893.
cross pelage: back grizzled black and whitish or buffy; sides buffy; feet, legs, and belly black; tail mainly black with tip white.

_Skull._—Compared with _cascadensis_, its nearest geographical neighbor, the rostrum is more slender, the bullae smaller, and in adult males the zygomatic much more spreading. The carnassials both above and below are slightly larger and more swollen; the 1st and 2d upper molars and 2d lower molar are _decidedly larger_. Briefly, the rostrum is more delicate and slender, the molars (except the 3d lower) larger and heavier. The heel of the 2d upper molar is broader and less emarginate posteriorly. Compared with _macrourus_ from the Rocky Mts., the resemblance is closer and the differences less marked: the rostrum is slightly narrower and more constricted laterally; the bullae slightly smaller; the upper molars slightly larger (heel broader); 3d lower molar decidedly smaller.

_Remarks._—Externally the High Sierra Fox in red pelage resembles the common red fox of the eastern United States (_fulvus_) much more closely than it does either _cascadensis_ or _macrourus_. It differs from _fulvus_ however in having the sides of the nose much darker (distinctly dusky); black of legs much restricted; fulvous of back duller and redder; ground color of tail buffy instead of fulvous.

_Vulpes necator_ is apparently more closely related to its Rocky Mountain ally (_macrourus_), now separated by the full breadth of the Great Basin, than to its immediate neighbor of the northern Sierra (_cascadensis_) whose range it doubtless meets, as _cascadensis_ has been found as far south as Mt. Raymond in Mariposa County, Calif.

_Measurements._—Type specimen (♀): total length 930; tail vertebrae 345; hind foot 150. A ♂ from Atwell’s Mill, on the west flank of the Sierra, measured: total length 1003; tail vertebrae 381; hind foot 171.

**VULPES CASCADENSIS** _sp. nov._

_pl. XXXVI, fig. 3._


(Black-cross phase.)

_Range._—Cascade Range in Oregon and Washington, and northern Sierra Nevada in California; northern limit unknown.

_Characters._—A short-tailed, small-toothed mountain fox of the _fulvus_ group, commonest in the ‘black-cross’ pelage; when in red pelage, yellow instead of fulvous (like a small edition of _regalis_). In
cranial and dental characters very close to fulves; not very close to macrourus.

**Color.**—Red phase: General color of head and upperparts straw yellow; face from nose to eyes dull yellowish fulvous; rest of top of head and base of ears pale straw yellow; back golden yellowish-fulvous; tail very pale; black of ears and feet greatly restricted, that of fore and hind feet confined rather narrowly to upper surface, and mixed with pale fulvous.

**Black-cross phase:** Top of nose grizzled brownish, sides of nose and imperfect ring around eye dusky or blackish, grizzled with whitish; top of head yellowish white, the black underfur showing through; dorsal cross (back and shoulders) blackish, overlaid and nearly concealed by yellowish white or buffy; sides of neck, flanks, and post-scapular region golden yellow; distal two-thirds of ear black; forefeet black, grizzled above elbow with whitish and yellowish; hind feet and legs grizzled dusky and buffy, becoming nearly black on top of feet; chin, throat, and band down middle of belly black or blackish; inner sides of thighs washed with dusky. Tail black mixed with buffy and tipped with white [in some specimens nearly all black to white tip]. Specimens from Mt. Hood and Ft. Klamath, Oregon, are practically identical with those from Trout Lake, State of Washington.

**Skull.**—Similar to that of fulves but bullae larger; 1st upper molar (and usually upper carnassial) slightly larger. Compared with macrourus the carnassials, 1st upper molar (and usually the 2d also), and 2d lower molar are smaller. The premolars also are usually smaller, particularly the lower series.

**Measurements.**—Average of three males from Mt. Adams, Washington: total length 1070; tail vertebra 412; hind foot 178.

**Vulpes rubricosa** Bangs. Nova Scotia Fox.

Pl. XXXVII, fig. 3.


**Type locality.**—Digby, Nova Scotia.

**Range.**—Nova Scotia—limits unknown.

**Characters.**—Size rather large; color deepest and darkest of all the red foxes; tail large, very broad and bushy, and deep fulvous. Rostrum and teeth larger than in fulves.

**Color.**—Upperparts deep rich and very dark fulvous; black of fore and hind feet reaching up a short distance on legs, but less extensive
than in *fulvus*; tail rich dark fulvous, with basal ring like back; rest of tail, except white tip, bountifully mixed with black hairs, most abundant below.

**Skull.**—Size essentially the same as *fulvus* of corresponding sex; similar to *fulvus* in general characters, but rostrum slightly more swollen; teeth larger. Premolars larger, more swollen, and less spaced; carnassials larger; 1st upper molar larger.

**Measurements.**—Type specimen (♀ old): total length 1077; tail vertebrae 401; hind foot 166 (from Bangs).

VULPES RUBRICOSA BANGSI subsp. nov.


**Range.**—Labrador—limits unknown.

**Characters.**—Similar externally to *fulvus* but ears smaller; black of ears and feet more restricted. Skull as in *rubricosa* and *deletrix*.

**Color.**—Upperparts golden fulvous, as in *fulvus*; tail bountifully mixed with black hairs; black of ears and feet more restricted. Skull as in *rubricosa* and *deletrix*.

**Measurements.**—(♂, not full grown, measured in flesh by collector): total length 964; tail vertebrae 378; hind foot 168; ear from notch 88.

VULPES DELETRIX Bangs.

Pl. XXXVII, fig. 2.


**Type locality.**—Bay St. George, Newfoundland.

**Range.**—Newfoundland.

**Characters.**—Color very pale—light straw yellow, deepening in places to golden yellow or even buffy fulvous; black of feet restricted; tail pale buffy yellowish with usual admixture of black hairs, but without black basal spot. Hind feet and claws very large (about 160 in ♀).

**Skull.**—Very close to that of *rubricosa* but averaging narrower; zygoma less spreading in male; bullae usually larger; teeth usually more swollen. Still, the resemblance is exceedingly close and I have been unable to find any positive character by which skulls of New-
foundland, Labrador, and Nova Scotia foxes may be certainly distinguished. Collectively they all differ from fulvus in slightly broader rostrum and decidedly larger teeth, as pointed out under rubricosa.

Measurements.—Type specimen (♀): total length 959; tail vertebrae 336; hind foot 161 (from Bangs).

VULPES ALASCENSIS sp. nov.


Range.—Northern Alaska—limits unknown.

Characters.—A large long-tailed red fox closely related to V. vulpes of Scandinavia and Siberia, and also to rubricosa and bangsi of Nova Scotia and Labrador. Color golden fulvous; tail very long; ears small; black of feet greatly restricted; pelage of neck and anterior part of back long and full, almost forming a ruff; pelage of posterior part of back and rump shorter and coarser.

Color.—Face and head grizzled fulvous and buffy, strongly rusty on top of nose and around eyes, paler on cheeks and forehead; upper parts fulvous or golden fulvous, much like Massachusetts specimens of V. fulvus but color deeper, particularly on top of neck and along dorsal line of back; rump and hind back grizzled; black of feet greatly restricted, that of forefeet not covering whole top of foot and not reaching above carpus; that of hind feet confined to median part of upper surface, spreading slightly over base of toes. Tail very long and bushy, fulvous like back, with the usual admixture of black hairs.

Skull.—Broad and relatively short, with broadly spreading zygoma, short and rather narrow rostrum (strongly constricted laterally on plane of 2d or between 2d and 3d premolars), and short upturned nose. Compared with its nearest geographical neighbors, harrimani and kenaiensis, the posterior part of the skull is much the same, while the anterior or facial part is greatly reduced (the rostrum being smaller, narrower, more constricted laterally), the nose more upturned, and the carnassial and molar tooth smaller. Compared with kenaiensis the carnassials, 1st upper molar, and 2d lower molar are decidedly smaller. Compared with harrimani the carnassials and molars are smaller and the anterointernal cusp of the upper carnassial is more anterior and less protruding laterally. Closely related to rubricosa and bangsi, with which it may intergrade; resembles rubricosa closely in size and proportions, but differs in having the rostrum slightly broader and more constricted laterally, the bullae slightly larger (usually), the upper lateral series of teeth heavier [lower series essentially as in rubricosa].
Remarks.—The Alaska red fox is evidently a large form of the small narrow-faced fulvus group, to which rubricosa belongs. It differs widely from the large-faced group to which harrimani, kenaiensis, and regalis belong. It is closely related to the typical Old World Vulpes vulpes of Sweden and northern Siberia, and appears to serve as a connecting link between this species and the small-faced fulvus group of eastern North America. It may be distinguished from vulpes, with which it agrees in size, by the following characters: rostrum more swollen immediately in front of orbits, more constricted laterally, shorter and more upturned anteriorly; bullae larger; basioccipital narrower; zygoma broader and more spreading; postorbital constriction less deep; incisive foramina shorter; anterointernal cusp of upper carnassial more prominent and forming a more decided angle with body of tooth; crowns of upper premolars usually longer anteroposteriorly. Compared with V. abietorum from Stuart Lake and Whitemud, the rostrum is much shorter and slightly broader; bullae slightly smaller; upper carnassial (and usually lower also) more swollen. Compared with V. fulvus from the eastern United States, alascensis is larger; the fur of the neck and fore-back is longer and fuller, forming a sort of ruff; the tail very much longer and larger; ears smaller; face redder or more rusty, especially around eyes and over bridge of nose; black of feet greatly reduced, as already described.

VULPES ALASCENSIS ABIETORUM subsp. nov.


Range.—Interior of British Columbia and probably southeastern Alaska.

Characters.—External characters unknown. The skull is generally like that of alascensis but lighter, longer, and more slender. Skulls of adult males resemble those of V. regalis but may be distinguished by the much smaller teeth.

Skull.—Similar to alascensis but longer, more slender, and less massive; rostrum decidedly longer and narrower; bullae usually larger; carnassials (particularly the upper ones), and usually the 1st upper molars also, more slender. Compared with V. regalis, with which the males agree closely in length, the posterior part of the skull is longer, the rostrum even more slender, and the sexual differences less marked; compared with skulls of the same sex of regalis, the males have smaller bullae and decidedly smaller carnassials and molars;
the females slightly longer skulls and slightly smaller lower carnassials. Compared with bangsi from Labrador, the rostrum is decidedly longer, the carnassials and large upper molar smaller and less swollen.

**Vulpes kenaiensis** sp. nov.

Pl. XXXVI, fig. 5.


**Range.**—Kenai Peninsula; limits of range unknown.

**Characters.**—Size large; external characters unknown; rostrum long and much more slender than in _harrimani_, but broader than in _regalis_. Skin not seen; pelage said to be softer and more valuable than the neighboring Kadiak animal (_harrimani_), which has very coarse fur.

**Skull.**—Largest of the known species; facial part large and long; muzzle very broad. Similar in general to _harrimani_ but rostrum decidedly longer, less swollen over canines, lateral constriction absent, and nose less upturned; zygomatic more spreading posteriorly; frontal broader interorbitally; premolars more spaced; upper carnassial and 1st upper molar huge; upper carnassial with anterointernal cusp weaker and set more anteriorly (not projecting so far into palate); 1st upper molar larger; 2d lower molar larger and more bellied on inner side; last lower molar often absent. _V. kenaiensis_ resembles _regalis_ from the northern plains in length of rostrum, breadth of zygomatica, and large size and proportions of carnassial and molar teeth, but differs in having the rostrum less slender, zygoma more spreading posteriorly, and premolars very much larger and more swollen—in this respect even exceeding those of _harrimani_. Hence, while in some particulars the species is intermediate between _harrimani_ and _regalis_, in others it departs materially from both.

**Cranial measurements.**—Type specimen (♂ ad): basal length 148; basilar length 145; palatal length 79; postpalatal length 68.5; zygomatic breadth 82.5; interorbital breadth 30.5; least breadth of rostrum on plane of 2d premolar (constriction absent) 27; length of crown of pm² on outer side 15.5; length of m¹ on outer side 11; length of heel (transversely) from notch on outer side 13.

**Vulpes Harrimani** Merriam.

Pl. XXXVI, fig. 6.


**Type locality.**—Kadiak Island, Alaska.

**Range.**—Kadiak Island, Alaska.
Character.-Size large; tail enormous, constricted at base, largest on basal fourth and tapering thence to tip; pelage coarse, wolf-like on tail and posterior half of back; hairs of neck and shoulders greatly elongated, forming a conspicuous ruff; those of posterior half of back abruptly much shorter and conspicuously grizzled.

Color.—Nose to between eyes pale dull fulvous, grizzled with whitish; top of head from between eyes to nape buffy whitish, grizzled with yellowish fulvous; anterior half of back bright yellowish fulvous, the color extending down over sides and belly nearly to median line; posterior half of back coarsely grizzled buffy-whitish and dull fulvous, reddest along median line; underparts yellowish-fulvous except chin, throat, inguinal region, and a narrower strip on belly, which parts are grayish-buffy; ears black; fore and hind legs and feet dull pale fulvous, with an irregular black patch on dorsal surface of fore-foot, and a much smaller one on hind foot; tail grizzled grayish and yellowish fulvous, the fulvous most marked on median line of upper surface, the black-tipped hairs less abundant than in related species but sufficiently plentiful on basal fourth of dorsal surface to form an indistinct black patch or spot; tip inconspicuously white or buffy white.

Skull.—Large and massive with large, broad, and relatively short rostrum, conspicuously swollen over roots of canines; premolars large and crowded. Closely related to V. kenaiensis from which it differs as follows: rostrum shorter, much broader and more swollen over canines; molar more upturned; frontals narrower; frontal sulcus deeper; zygomatic less spreading; upper carnassial usually heavier with anterointernal cusp more strongly developed and set out at greater angle from axis of tooth; 2d upper and 2d lower molar: smaller. (These tooth characters are probably not constant.)

Compared with regalis, with which it agrees in general size, the rostrum and palate are broad and short [instead of long and slender], zygomatic less spreading; upper carnassial thicker and heavier with anterointernal cusp strongly developed and projecting at right angle into palate; lower carnassial more swollen (broader, but shorter anteroposteriorly); 2d lower molar smaller, narrower, and more rectangular (less convex or bellied on inner side.)

Measurements.—Type specimen [a dry skin]: total length 1260; tail vertebrae [approximate] 450; tail to end of hairs 550; greatest diameter of tail, hairs laid naturally, 160; greatest diameter of tail, hairs spread, 250.

Cranial measurements.—Skull no. 98144, from Uyak Bay, Kadiak
Island: basal length 140; zygomatic breadth 77; palatal length 74.5; postpalatal length 65; breadth across postorbital processes 33; interorbital breadth 27.5; postorbital constriction 22.5; greatest breadth of rostrum over roots of canines 26.3; lateral series of teeth (from front of canine to back of last molar) 66.

VULPES REGALIS sp. nov. Northern Plains Fox.


Range.—Northern Plains from Dakota to Alberta; east to Manitoba and Minnesota; limits unknown.

Characters.—Size largest; ears very large and broad; tail very long but diameter less than in rubricia; sexual difference in size great; color a beautiful golden yellow, becoming almost buffy-white on face and posterior part of back; legs abruptly dark fulvous; black of feet very pure but restricted in area.

Color.—Face, top of head, and base of ears pale straw yellow becoming pale fulvous around eyes; a darker area on each side of nose, reaching from whiskers nearly to eye; upperparts golden yellow or pale yellowish fulvous, becoming almost buffy-white posteriorly and grizzled on hinder part of back; fore and hind legs abruptly red or rusty fulvous, in striking contrast with yellow of body; forefeet intensely black, the black reaching up on front face of leg, narrowly, to halfway between wrist and elbow; hind feet intensely black on upper surface, the black narrowing posteriorly and ending at or near ankle; dark fulvous of outer side of thigh sometimes narrowly mixed with grizzled black and whitish. Tail with basal ring like back, without black hairs; rest of tail to white tip buffy, strongly intermixed with long black hairs, especially on underside.

Skull.—Skull large, long, and relatively massive, with long slender rostrum, broadly spreading zygomatic, large inflated bullae, and narrow slender premolars. Compared with V. kenaiensis, its nearest ally, it may be distinguished by more slender rostrum, and very much narrower and more spaced premolars. From harrimani it differs in slightly greater length; much longer and narrower rostrum and palate; more spreading zygomatic; larger and more inflated bullae; less prominent frontonasal sulcus; narrower and more spaced premolars; narrower upper carnassial, with anterointernal cusp weaker and less projecting over palate; upper molars decidedly larger; lower carnassial
more slender; 2d lower molar broader and more bellied on inner side.

On account of the great disparity in size, skulls of *V. regalis* require no comparison with those of the same sex of the *fulvus* group; but females of *regalis* agree so closely in size with males of *fulvus* that care is necessary to distinguish them. *V. regalis* may be known by the size of the bullae, which are larger, and the form of the postglenoid process, which is much broader at base, shorter, and less vertical.

**Measurements.**—Type specimen (♀ ad.): total length, in flesh, 1117; tail vertebrae from well made dry skin 420; hind foot in dry skin 170; ear from anterior base in dry skin 98. An adult ♀ from Carberry, Manitoba, measured in flesh: total length 1050; tail 392; hind foot (dry) 157.
PLATE XXXVI.

Carnassial and molar teeth of Red Foxes. All natural size.

Fig. 1. *Vulpes macrourus*, ♀. Arkins, Colo., Nov. 29, 1894. No. 69982, U. S. Nat. Mus., Biological Survey Coll.
PLATE XXXVII.

Carnassial and molar teeth of Red Foxes. All natural size.


(676)