with the Author's compli

U. S. DEPARTMENT OF AGRICULTURE
DIVISION OF BIOLOGICAL SURVEY

NORTH AMERICAN FAUNA

No. 20

[Actual date of publication, August 31, 1901]

REVISION OF THE SKUNKS OF THE GENUS CHINCHA

BY

ARTHUR H. HOWELL
ASSISTANT, BIOLOGICAL SURVEY

Prepared under the direction of

Dr. C. HART MERRIAM
CHIEF OF DIVISION OF BIOLOGICAL SURVEY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1901

CONTENTS OF NORTH AMERICAN FAUNA.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Division of Biological Survey,
Washington, D. C., July 5, 1901.

Sir: I have the honor to transmit herewith for publication as No. 20 of North American Fauna a report entitled "Revision of the Skunks of the Genus *Chincha*," by Arthur H. Howell, assistant in the Biological Survey.

Respectfully,

T. S. Palmer,
Acting Chief, Biological Survey.

Hon. James Wilson,
Secretary of Agriculture.

CONTENTS.

ILLUSTRATIONS.

No. 20. NORTH AMERICAN FAUNA. August, 1901.

REVISION OF THE SKUNKS OF THE GENUS CHINCHA.[1]

By Arthur H. Howell.
Assistant, Biological Survey.

INTRODUCTION.

HISTORY.

Skunks have figured in literature since the early part of the seventeenth century. Their peculiar means of defense has served to make them conspicuous, but the repugnance in which they are commonly held has doubtless prevented as thorough study of their habits and characteristics as has been accorded to other common mammals.

Apparently the first account of them is that given by Gabriel Sagard-Théodat in his history of Canada, published in 1636, in which he refers to the ill-smelling qualities of these '*enfans du diable.*'[2] In 1651 Hernandez gave an account of the Mexican skunks, which he confused somewhat with the nasua.[3] It was on this description that Linnæus primarily based his *Viverra memphitis*. Buffon, in 1765, gave a description and figure of a skunk, which he called '*le chinche*'[4]—a name taken from Feuillée, who in 1714, in an account of his travels in South America, had recorded this as the native name of the skunk occurring near Buenos Ayres.[5] Buffon's account has served as the basis for many of the later names applied to the skunks. He ascribes '*le chinche*' to South America, but his figure evidently represents one of the skunks of the genus *Chincha*, which is strictly North American. The confusion of the skunks of the two continents, for which this error is partly responsible, has continued, though in a lessening degree, to the present day.

[1] *Chincha* of this paper is the equivalent of *Mephitis* of recent authors. For a discussion of the reasons for this change, see p. 14.

[2] Histoire du Canada, p. 748, Paris, 1636.

[3] Thesaurus Rer. Med. Novæ Hisp., p. 332, Rome, 1651.

[4] Histoire Naturelle, XIII, p. 294, pl. 39, Paris, 1765.

[5] Journal du P. Feuillée, p. 272; Paris, 1714.

Schreber, in 1776, gave a good description of the large North American skunk, and his specific name *mephitis* is the first one available for any member of the genus. Cuvier, in 1800, applied the same name in a generic sense to the '*mouffettes*,' his group including both the large and small skunks of North America, since separated into different genera.[1] During the early years of the nineteenth century the large skunks, which form the basis of this paper, were treated by many authors, and some new names were proposed; but for the most part the descriptions are hopelessly confused and the names are unidentifiable. In 1829 Richardson described *hudsonica* from central Canada; in 1832 Lichtenstein named *mesomelas* from Louisiana and *macroura* and *vittata* from Mexico; and in 1837 Gray described *varians* from Texas and *mexicana* (the same as *macroura*) from Mexico.

Up to 1838 the North American skunks had all been included in a single undivided genus, *Mephitis*, but in this year Lichtenstein published an extended revision of the group, in which he classed the white-backed skunks as a subgenus under the name *Thiosmus*, but did not separate the little spotted skunks from their larger relatives.[2] In 1842 Lesson published a brief but important synopsis of the genus, in which he arranged the species in three groups, restricting *Mephitis* in a subgeneric sense to the little spotted skunks, naming the large striped skunks *Chincha* and retaining *Thiosmus* for the white-backed skunks.[3] Lesson's *Mephitis* and *Chincha*, proposed as subgenera, are perfectly tenable as genera, and are here used in that sense, *Mephitis* for the little spotted skunks, commonly known as *Spilogale*, and *Chincha* for the large striped skunks, commonly known as *Mephitis*.

Boitard, in 1842, proposed three new names for the large skunks, all of which probably refer to the same species, though only one, *putida*, is certainly identifiable. This is available for the eastern skunk. In 1857 Baird named the California skunk *occidentalis*. For several decades after this the group received very little attention from systematists, but during the last few years there has been considerable activity in the naming of species. In 1890 *estor* was proposed by Merriam; in 1895, *elongata* by Bangs; in 1896, *scrutator* by Bangs, and *fossidens* and *orthostichus* (fossils) by Cope; in 1897, *holzneri* and *milleri* by Mearns; in 1898, *avia* and *spissigrada* by Bangs, and in 1899, *fœtulenta* by Elliot, and *leptops* and *obtusatus* (fossils) by Cope.

DISTRIBUTION.

The skunks of the genus *Chincha* range over the greater part of North America, from the Hudsonian zone in Canada to Guatemala. The northern limits of their distribution are not definitely known.

[1] Leçons d'Anat. Comp., I, tabl. 1, 1800.
[2] Abh. Akad. Wiss. Berlin for 1836, pp. 249–312, 1838.
[3] Nouv. Tabl. de Règne Anim., p. 67, 1842.

In the interior they occur as far north as Great Slave Lake, as shown by a specimen from that locality in the U. S. National Museum, and by the statement of B. R. Ross, who says that while he has never seen a living specimen on the Mackenzie River, he has found the bones and part of the skin a short distance from the shores of Great Slave Lake.[1] On the Atlantic coast they have not been recorded north of Nova Scotia. On the Pacific slope the most northerly record is Stuart Lake, British Columbia, though on the immediate coast of the Pacific they are not reported farther north than Howe Sound, in southern British Columbia, and probably do not occur much beyond this point. In the United States they are generally distributed, except in the higher mountains, and in many places are extremely numerous. They are absent or very rare in eastern North Carolina, according to Mr. Outram Bangs,[2] and perhaps the same is true of other small areas within their range.

The subgenus *Chincha* ranges but a short distance into Mexico: *C. estor* reaches southern Chihuahua in the Sierra Madre, *holzneri* enters Lower California, and *varians* occurs in eastern Mexico in the Rio Grande Valley. The subgenus *Leucomitra*[3] occupies nearly the whole of Mexico, and its range overlaps that of the subgenus *Chincha* in southern Arizona. It is chiefly confined to the Sonoran and Transition zones, not occurring in the tropical lowlands except on the coast of Oaxaca. The southern limit of its range is not known, but it probably does not extend beyond the highlands of Guatemala.

HABITS.

The large skunks are wholly terrestrial, living in caves, in the deserted burrows of other animals, or in burrows of their own excavation. They do not avoid the habitations of man, but seem rather to prefer the clearings and pastures about the farm, and frequently make their abode under a house or other building. They are sluggish in movement, and usually show little fear of human beings, depending for safety more on the efficacy of their malodorous discharge than on attempts to escape. Although chiefly nocturnal, they are often seen moving about in the daytime, especially in the morning and evening. They hibernate only during the severest part of the winter, and probably only in northern latitudes.

Their food consists largely of small mammals, reptiles, batrachians, insects, and birds' eggs; and they apparently have no difficulty in securing an abundance, for they frequently become excessively fat. They are particularly fond of insects, and during the seasons when grasshoppers are abundant feed extensively on these pests. In many parts of

[1] Canadian Nat. and Geol., VII, p. 139, 1862.

[2] Proc. Biol. Soc. Wash., X, p. 139, 1896.

[3] See p. 39.

the United States they have been found useful in destroying the 'white grub,' a great pest in lawns and meadows. Fish and crustaceans, when available, and even carrion or other refuse, are readily eaten. They occasionally rob the poultry yard, but such depredations as they commit are more than offset by their destruction of noxious mammals and insects. Vegetable matter is sometimes eaten. Mr. E. A. Goldman reports that he has found roots and wild fruits in the stomach of a hooded skunk.

Skunks have been extensively trapped for furs ever since the settlement of the country by white men,[1] and within the last few years attempts have been made to breed them in confinement; but although 'skunk farms' have been started in several States, the industry seems not yet well established.

EXTERNAL CHARACTERS.

Skunks are too well known to need more than a passing reference to their external appearance. They are stocky animals, particularly heavy behind, with slender nose, small ears, short legs, long fore claws, and long bushy tail. The pelage is long, loose, and silky; the under-fur is quite dense, especially in northern latitudes; and the tail hairs are coarse and flaccid. The colors are black and white, the white usually arranged in a narrow frontal stripe and two na row dorsal bands or one broad band covering the whole back, but the pattern of coloration is subject to much variation. During spring and summer the pelage often becomes much worn and faded, and the glossy black of the winter pelage is frequently replaced by a dull brown. There is apparently but one molt in a year, and this usually occurs in late summer or in autumn.

The females are always smaller than the males and less specialized in their cranial characters, which are often of so little prominence that they do not serve to readily distinguish closely related species. The difference in size is most marked in the larger species. Thus in *Chincha notata* the average length of the skull is 10 percent greater in males than in females, and the average zygomatic breadth 14 percent greater.

The teats usually number 10 to 14. The young are born in litters of from 4 to 10, and reach maturity at a very early age, the bones of the skull completely coalescing before the teeth show any appreciable signs of wear.

That which particularly distinguishes skunks from other animals is their means of defense, consisting of a characteristic malodorous fluid, which, when ejected, speedily disarms the boldest aggressor. The

[1] During the forty years from 1850 to 1890 the Hudson Bay Company alone shipped over 250,000 skunk skins to England.

fumes from the fresh liquid are overpowering in their pungency, and are possessed of remarkably penetrating and lasting properties.[1] The fluid is secreted by two anal glands, similar in character to those possessed by other members of the Mustelidæ, but larger and more muscular. Dr. C. Hart Merriam has given a concise description of these glands, as follows:

> The glands lie on either side of the rectum, and are imbedded in a dense, gizzard-like mass of muscle which serves to compress them so forcibly that the contained fluid may be ejected to the distance of four or five metres (approximately 13 to 16½ feet). Each sac is furnished with a single duct that leads into a prominent, nipple-like papilla that is capable of being protruded from the anus, and by means of which the direction of the jet is governed.[2]

MATERIAL.

The present revision is based chiefly on a study of the specimens in the collections of the U. S. Biological Survey and the U. S. National Museum, supplemented by much additional material from the collection of the American Museum of Natural History, New York, and the private collections of Dr. C. Hart Merriam and Mr. Outram Bangs. The total number of specimens examined exceeds 950, among which are all the existing types. The Biological Survey collection contains good series of skins and skulls of most of the species, and is particularly rich in large series of extra skulls, which have proved of great value in showing the range of individual variation.

My thanks are cordially extended to Dr. C. Hart Merriam for the privilege of using the collections under his charge. Thanks are also due Dr. J. A. Allen and Mr. Frank M. Chapman, of the American Museum of Natural History, Mr. Gerrit S. Miller, jr., of the U. S. National Museum, Mr. D. G. Elliot, of the Field Columbian Museum, Mr. Witmer Stone, of the Academy of Natural Sciences, Philadelphia, and Mr. William Brewster, of the Museum of Comparative Zoology, Cambridge, for the loan of material under their charge. I am especially indebted to Mr. Outram Bangs for the use of a fine series of skunks from his collection, including the types of all his species.

The illustrations in the present paper are from photographs taken by Dr. A. K. Fisher, of the Biological Survey.

One new subgenus (*Leucomitra*) and three new species and subspecies (*Chincha occidentalis major*, *C. occidentalis notata*, and *C. platyrhina*) are here described.

NOMENCLATURE.

Three generic and 35 specific names have been applied to the skunks of this group. The general similarity in external characters among the members of the genus has led to the inclusion of widely different

[1] For a valuable account of the chemical properties of this fluid see T. B. Aldrich, Journ. Exp. Med., I, pp. 323–340, 1896; II, pp. 439–452, 1897.

[2] Mammals of the Adirondack Region, Trans. Linn. Soc., N. Y., I, p. 76, 1882.

forms under one name, while the extreme variability in some species has multiplied synonyms. The confused state of the nomenclature makes necessary a brief statement of the status of each name.

GENERIC NAMES.

Viverra Linnæus, **1758.** Syst. Nat., ed. X, pp. 43–44,

The genus comprehended five species: *V. ichneumon*, *V. memphitis*, *V. putorius*, *V. zibetha* (usually considered the type), and *V. genetta*. The American skunks were referred to it by authors prior to Cuvier, 1800, but it is now restricted to the Old World civets.

Mephitis Cuvier, **1800.** Leçons d'Anat. Comp., I, tabl. 1.

Cuvier proposed this genus to include the '*mouffettes*,' but as no species are mentioned, it is necessary, in order to determine its specific constituents, to refer to his 'Tableau Elementaire,' published two years previously.[1] In this work he places the *mouffettes* as a subgroup of *Mustela*, and mentions two species, *Viverra putorius* Linn. and *V. mephitis* Linn.[2] The latter was removed in 1842 to become the type of the genus *Chincha* Lesson, which leaves *V. putorius*, one of the little spotted skunks, as the type of *Mephitis*. The name *Spilogale*, proposed in 1865 by Gray for the little spotted skunks, will therefore have to be abandoned, becoming a synonym of *Mephitis*, which thus unfortunately proves to be the name of this group of skunks instead of the group for which it has so long been used.

Chincha Lesson, **1842.** Nouv. Tableau Règne Anim., Mamm., p. 67.

Lesson proposed this as the name of a subgenus of *Mephitis*, with *Chincha americana* as the type species; *hudsonica* Richardson is given as a variety, but no other species are placed in the group. The references show that his type species is based on *Viverra mephitis* Erxleben, which in turn is based on *V. mephitis* Schreber—a plainly recognizable species. If we assume (as we can with all propriety) that Cuvier, in placing '*Viverra mephitis* L.' as one of the types of his genus *Mephitis* referred to *V. mephitis* of Gmelin's edition, we then have for the type of *Chincha* a species which is one of the two originally composing the Cuvierian genus *Mephitis*, and one that is likewise identifiable, for *V. mephitis* Gmelin is based on *V. mephitis* Schreber.

[1] Tabl. Element. de l'Hist. Nat. des Anim., p. 116, 1798.

[2] This name does not appear in either the 10th or 12th editions of Linnæus, so we must assume that the reference is to Gmelin, 1788; *memphitis* of the 10th edition is a different name (see p. 18) and Cuvier's description shows that the animal he had in mind was a skunk, and not the composite species which Linnæus described under the name *memphitis*.

It is perfectly clear, therefore, that Lesson intended to apply the name *Chincha* to the large two-striped North American skunks, and it is used for these in a generic sense in the present paper.

[NOTE.—In a list of names of Mexican animals by A. L. Herrera,[1] '*Mammephitisus macrura*' is used for the '*zorillo*' (the vernacular name of the hooded skunk in Mexico). All of Herrera's names are modified forms of accepted generic names, and until such time as his system shall have been adopted, his names require no consideration.]

SPECIFIC AND SUBSPECIFIC NAMES.

americana (*Mephitis*) Desmarest, **1818**. Nouv. Dict. d'Hist. Nat., Paris, XXI, p. 514.

This name was applied to a composite species, including as varieties all the skunks of North and South America. The first author to use it in a restricted sense was Sabine, who in 1823 applied it to the skunks of Canada.[2] He says that the animals "under examination are the particular sort designated as the *Viverra mephitis* of Gmelin," which is variety No. 7 of Desmarest. The name *americana* therefore becomes a synonym of *mephitis*.

avia (*Mephitis*) Bangs, **1898**. Proc. Biol. Soc. Wash., XII, p. 32.

Under this name Bangs described a form from San Jose, Illinois. It proves to be closely related to *mesomelas*, of which it is considered a subspecies.

bivirgata (*Mephitis americana*) Ham. Smith, **1839**. Jardine's Nat. Libr., Mamm., I, p. 196.

The description under this name probably refers to the eastern skunk (*Chincha putida*), but no type locality is assigned, and the species can not be identified with certainty.

cinche (*Viverra*) Müller, **1776**. Natursyst. Suppl., p. 32.

The species thus named is based on the *chinche* of Buffon, which probably belongs to this genus, but is not certainly identifiable. Müller follows Buffon in ascribing the animal to South America, where *Chincha* does not occur.

concolor (*Mephitis*) Gray (Verreaux MS.?), **1865**. Proc. Zool. Soc. London, 1865, p. 149.

Published by Gray under his 'var. *c. vittata*', with 'Verreaux MS.?' as authority. The form thus named is evidently only one of the many variations to which *vittata* is subject, and although Gray afterwards raised it to subspecific rank[3], the name must be regarded as a synonym.

[1] Sinonimia Vulgar y Cientifica de los Principales Vertebrados Mexicanos, p. 30, 1899.

[2] Franklin's Narrative of a Journey to the Polar Sea (1819–1822), App., p. 653, 1823.

[3] Cat. Carnivora, Brit. Mus., p. 138, 1869.

edulis (*Memphitis*) Coues (Berlandier MSS.), **1877.** Fur-Bearing Animals, p. 236.

Berlandier (as quoted by Coues) gives a brief description of a skunk from Mexico which is probably *macroura*. The name will stand as a synonym of the latter.

elongata (*Mephitis mephitica*) Bangs, **1895.** Proc. Boston Soc. Nat. Hist., XXVI, p. 531.

Under this name Bangs described the Florida skunk. It proves to be a distinct species, most nearly related to *putida*.

estor (*Mephitis*) Merriam, **1890.** N. Am. Fauna No. 3, p. 81.

The species described under this name by Merriam is a well-marked form inhabiting Arizona and northern Mexico.

fetidissima (*Mephitis*) Boitard, **1842.** Jardin des Plantes, Mamm., p. 147.

Boitard proposed this name on the same page with *olida* and *putida*. The form thus named is probably one of the many variations of the common eastern skunk, but as no more definite type locality is assigned than 'United States,' the name can not be specifically applied.

fœda (*Viverra*) Boddært, **1785.** Elenchus Animalium, I, p. 84.

This is one of the many early names which can not be specifically identified. Boddært quotes Buffon, Schreber, and other early authors, but assigns his species to Mexico.

fœtulenta (*Mephitis*) Elliot, **1899.** Field Columbian Museum, Pub. 32, Zool. Ser., I, no. 13, p. 269.

The form to which this name was applied proves to be practically identical with that to which Bangs had previously given the name *spissigrada*, of which *fœtulenta* is, therefore, a synonym.

fossidens (*Mephitis*) Cope, **1896.** Proc. Acad. Nat. Sci. Phila., p. 386.

This name was applied by Cope to a well-marked fossil species from the Pleistocene bone caves at Port Kennedy, Pennsylvania.

frontata (*Mephitis*) Coues, **1875.** Bull. U. S. Geol. & Geog. Surv. Terr., 2d series, no. 1, p. 7.

The form described by Coues under this name was based on a skull found in the Post-pliocene deposits of Pennsylvania. While the characters assigned to it by him are of slight weight, it differs from the living species in dental characters, and seems worthy of specific recognition.

holzneri (*Mephitis occidentalis*) Mearns, **1897.** Proc. U. S. Nat. Mus., XX, p. 461.

Mearns proposed this name for the form of *occidentalis* occupying southern California and northern Lower California (type locality, San Isidro Ranch). It is a rather poorly marked subspecies that ranges north to the vicinity of Monterey Bay.

hudsonica (*Mephitis americana*) Richardson, **1829.** Fauna Boreali-Americana, I, Mamm., p. 55.

Richardson's name, applied to the skunk of the Northern plains, proves available for the species ranging from Colorado north to the interior of Canada.

intermedia (*Mephitis vittata*, var. *b.*) Gray, **1869.** Cat. Carnivora Brit. Mus., p. 138.

This name is applied to one of the numerous varieties of the hooded skunks due to individual variation. It is a synonym of *vittata*.

laticaudata (*Mephitis*) E. Geoffroy, **1803.** Cat. Mamm. Mus. National d'Hist. Nat., Paris, p. 109.

This name can not be satisfactorily identified. The references indicate that the type specimen belonged to the genus *Chincha*, but the description applies more nearly to one of the South American skunks.

leptops (*Mephitis*) Cope, **1899.** Journ. Acad. Nat. Sci. Phila., 2d series, XI, pt. 2, p. 235.

This name was applied to a fossil species from the Port Kennedy bone caves, Montgomery County, Pennsylvania. I have not had an opportunity to compare it with specimens of recent species.

longicaudata (*Mephitis*) Tomes, **1861.** Proc. Zool. Soc. London, 1861, p. 280.

Under this name Tomes described the form from Dueñas, Guatemala. Specimens from near the type locality have been compared with those of *macroura* and are found to be practically identical.

macroura (*Mephitis*) Lichtenstein, **1832.**[1] Darst. Säugeth., pl. 46, with accompanying text.

Lichtenstein's plate and description are sufficient to identify the species thus named by him, which came from the 'mountains northwest of the City of Mexico.' This is the first name applied to any of the hooded skunks.

memphitis (*Viverra*) Linnæus, **1758.** Syst. Nat., p. 44.

A name applied by Linnæus to an unrecognizable species, evidently part skunk and part nasua. There is nothing in the description to indicate even the genus to which it refers, and it seems best to reject the name as indeterminable. It is quite distinct from *mephitis*, as shown below.

mephitica (*Viverra*) Shaw, **1792.** Museum Leverianum, p. 171.

This name has been generally adopted by recent authors for the eastern skunk, and was restricted by Bangs in 1895 to the northeastern

[1]The date of publication of that portion of the 'Darstellung' in which the skunks are described is fixed by Lichtenstein himself in a later paper (Abh. Akad. Wiss. Berlin for 1836, p. 303, 1838).

species. Schreber's name *mephitis*, however, is perfectly tenable for the same species, and being of earlier date is adopted instead of *mephitica*.

mephitis (*Viverra*) Schreber, **1776.** Säugth., III, p. 447 tab. 121.

Recent authors have rejected this name on the ground that it is preoccupied by *Viverra memphitis* Linn., 1758, supposed to be a misprint for *mephitis*. Through the kindness of Mr. J. E. Harting, of London, who has examined for me a copy of the tenth edition of Linnæus's 'Systema Naturæ' in the Linnæan Society Library, which contains numerous corrections and annotations in the author's own handwriting, sufficient evidence has been brought to light to show that Linnæus intended to write *memphitis*, which must therefore be considered entirely distinct from *mephitis*. In this copy of Linnæus Mr. Harting finds that although certain alterations[1] are made in the diagnosis, the spelling of *memphitis* is not corrected. Still other evidence of the validity of the name is adduced by Mr. Harting, who writes: "That he [Linnæus] meant *memphitis* to stand is clear, not only from his leaving the spelling uncorrected in his annotated tenth edition, but by his rewriting it in a marginal note to his copy of Ray's 'Synopsis Animalium,' 1693, wherein, on p. 181, he identifies it with Ray's '*Yzquiepatl seu Vulpecula.*' Opposite these words he has written '*Viverra memphitis*,' distinctly."

Schreber's name *mephitis*, then, is not preoccupied, and being accompanied by a recognizable description, is adopted as the first name for the Canada skunk.

mesomelas (*Mephitis*) Lichtenstein, **1832.** Darst. Säugeth., pl. 45, with accompanying text.

Lichtenstein's specimen, on which the species thus named is based, was secured from a natural history dealer, and was said to have come from Louisiana. The measurements show it to be the small species inhabiting the southern Mississippi Valley, subsequently named *scrutator* by Bangs.

mexicana (*Mephitis*) Gray, **1837.** Charlesworth's Mag. Nat. Hist., I, p. 581.

Gray's brief description under this name probably refers to one of the forms of *macroura*, of which *mexicana* is therefore a synonym.

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[1] The alterations referred to consist in the substitution for the original diagnosis, of the following:

"*V. alba subtus nigro maculata;*" and the entry in the margin of the query, "*an nasua?*"

The diagnosis as altered agrees with the later portion of the description, and the nasua element is largely removed, although the references point principally to that animal (cf. Bangs, Proc. Boston Soc. Nat. Hist., XXVI, p. 529, 1895).

That Linnæus himself was in doubt as to the validity of the species is shown both by the annotations above mentioned, and by the omission of the name from his twelfth edition.

milleri (*Mephitis*) Mearns, **1897**. Proc. U. S. Nat. Mus., XX, p. 467.

The form thus named was described from Fort Lowell, Arizona. It proves to be a northern race of the hooded skunk, for which this is the only name.

obtusatus (*Mephitis*) Cope, **1899**. Journ. Acad. Nat. Sci. Phila., 2d series, XI, pt. 2, p. 236.

Cope gave this name to an extinct species based on a single jaw discovered in the Port Kennedy bone deposit (Pennsylvania), but his type can not now be found. It is described as a very small species, the size of a weasel.

occidentalis (*Mephitis*) Baird, **1857**. Mamm. N. Am., p. 194.

Under this name Baird described the western skunk. It is a wide-ranging species for which there is no other name.

olida (*Mephitis*) Boitard, **1842**. Jardin des Plantes, Mamm. p. 147.

As in the case of *fetidissima*, described on the same page, this name was probably intended to apply to one of the forms of the eastern skunk, but in the absence of a definite type locality, no specific application can be made.

orthostichus (*Mephitis*) Cope, **1896**. Proc. Acad. Nat. Sci. Phila., p. 389.

Cope described the species thus named from remains found in the Port Kennedy bone caves, Pennsylvania. It appears to be quite distinct from any living species.

putida (*Mephitis*) Boitard, **1842**. Jardin des Plantes, Mamm. p. 147.

This is the first name applicable to the eastern skunk in connection with which the type locality is definitely fixed. Boitard refers to it as '*La Moufette de New Jersey*' and gives a brief description of the animal. The name is adopted for the species long known as *mephitica*.

scrutator (*Mephitis mephitica*) Bangs, **1896**. Proc. Biol. Soc. Wash., X, p. 141.

Under this name Bangs described the form from Louisiana as a subspecies of the Canada skunk. It proves to be quite distinct from the latter, and is a well-marked form, for which, however, Lichtenstein's name *mesomelas*, of much earlier date, must be used.

spissigrada (*Mephitis*) Bangs, **1898**. Proc. Biol. Soc. Wash., XII, p. 31.

The form thus named was described by Bangs from Sumas, British Columbia. It proves to be a northern race of *occidentalis*.

varians (*Mephitis*) Gray, **1837**. Charlesworth's Mag. Nat. Hist., I, p. 581.

The description of the form thus named is inadequate, and the type locality ('Texas') indefinite, but Gray's statement in a later paper that the tail is as long as the body fixes the name to the large skunk of southern and western Texas. The type specimen can not be found.

vittata (*Mephitis*) Lichtenstein, **1832.** Darst. Säugeth. plate 47, with accompanying text.

Lichtenstein described under this name the species found at San Mateo del Mar, Oaxaca, Mexico. It proves to be a well-marked form of the hooded skunk group.

Genus CHINCHA Lesson.

Generic characters.—Skull highly arched, highest in frontal region; rostrum truncated with slight obliquity; posterior margin of palate nearly on a line with posterior border of last molars; periotic region not inflated; mastoid and paroccipital processes prominent; post-orbital processes not prominent; coronoid process of mandible conical, erect. Dental formula: $i.\ \frac{3-3}{3-3}$, $c.\ \frac{1-1}{1-1}$, $pm.\ \frac{3-3}{3-3}$, $m.\ \frac{1-1}{2-2}=34$. Snout not greatly produced; nostrils lateral; tail long and bushy.

The genus *Chincha* is a member of the subfamily Mephitinæ, which also includes three other genera, *Mephitis*, *Thiosmus*,[1] and *Conepatus*, of which only the first two occur in North America. *Mephitis* may be readily distinguished by the color pattern, which consists of numerous white stripes (always more than two) broken into many patches or spots. *Thiosmus* differs from the other two North America genera in having the snout produced, and bare for a considerable distance from the tip, with the nostrils inferior; tail short and sparsely haired; and usual color pattern black, with a solid white band covering the entire back and part or all of the tail.

Key to species and subspecies.

[Based on adult males.]

Audital bullæ greatly inflated; back usually either wholly black or wholly white ..... (Subgenus *Leucomitra*, p. 39)
Smaller; bullæ much inflated ..... *vittata* (p. 43)
Larger; bullæ less inflated.
Tail much longer than body ..... *milleri* (p. 42)
Tail not longer than body ..... *macroura* (p. 41)
Audital bullæ not greatly inflated; back usually with a white stripe, divided posteriorly ..... (Subgenus *Chincha*, p. 22)
Palate with prominent spine.
Tail longer than body ..... *elongata* (p. 27)
Tail shorter than body ..... *putida* (p. 25)

[1] *Thiosmus* Lichtenstein, Abh. Akad. Wiss. Berlin for 1836, p. 270, 1838. Material in the collection of the Biological Survey indicates that *Conepatus* Gray, described from Patagonia, will have to be separated from the white-backed skunks usually known under this name. The white-backed skunks will, in such event, require another name; and since *Thiosmus* Lichtenstein seems to be the earliest one that is available, it is here provisionally adopted for this group.

Palate without prominent spine.
Tail less than half the length of body.....*mephitis* (p. 22)
Tail more than half the length of body.
Tail usually more than 350 mm. (Texas).....*varians* (p. 31)
Tail usually less than 350 mm.
Skull small (basilar length[1] less than 66 mm.).
Body stripes very broad.....*estor* (p. 32)
Body stripes narrower.
Tail more than 250 mm.....*holzneri* (p. 38)
Tail less than 250 mm.
Skull smaller (basilar length usually under 60 mm.).*mesomelas* (p. 29)
Skull larger (basilar length usually over 60 mm.).....*avia* (p. 30)
Skull large (basilar length more than 66 mm.).
Body stripes narrow; frequently not continuous.....*notata* (p. 36)
Body stripes broad; always continuous.
Tail usually more than 285 mm.
Skull very broad (mastoid breadth more than 45 mm.)..*major* (p. 37)
Skull narrower (mastoid breadth less than 45 mm.).
Rostrum very broad (breadth across post-orbital processes more than 24 mm.).....*platyrhina* (p. 39)
Rostrum narrower (breadth across post-orbital processes less than 24 mm.).....*occidentalis* (p. 34)
Tail usually less than 285 mm.
Palate extending back of last molars.....*hudsonica* (p. 24)
Palate ending on a line with last molars.....*spissigrada* (p. 35)

List of Species and Subspecies, with Type Localities.

Subgenus CHINCHA.

Species and subspecies.	Type localities.
Chincha mephitis (Schreber)	America (restricted to eastern Canada).
hudsonica (Richardson)	Plains of the Saskatchewan.
putida (Boitard)	New Jersey.
elongata (Bangs)	Micco, Brevard County, Florida.
mesomelas (Lichtenstein)	Louisiana.
mesomelas avia (Bangs)	San Jose, Illinois.
mesomelas varians (Gray)	Texas.
estor (Merriam)	San Francisco Mountain, Arizona.
occidentalis (Baird)	Petaluma, California.
occidentalis spissigrada (Bangs)	Sumas, British Columbia.
occidentalis notata nobis	Trout Lake, Mount Adams, Washington.
occidentalis major nobis	Fort Klamath, Oregon.
occidentalis holzneri (Mearns)	San Isidro Ranch, Lower California.
platyrhina nobis	South Fork Kern River, California.

Subgenus LEUCOMITRA.

Chincha macroura (Lichtenstein)	Mountains northwest of City of Mexico.
macroura milleri (Mearns)	Fort Lowell, Arizona.
macroura vittata (Lichtenstein)	San Mateo del Mar, Oaxaca, Mexico.

[1] Basilar length of Hensel, measured from inferior lip of foramen magnum to posterior rim of alveolus of middle incisor.

Subgenus CHINCHA. Large Striped Skunks.

Subgeneric characters.—Skull (Pls. V, VI, and VII) long and relatively narrow interorbitally; zygomata usually spreading broadly; interpterygoid fossa broad; palate ending either squarely or with a median notch or spine; audital bullæ not greatly inflated; anterior palatine foramina usually small and narrow; mastoids, and sagittal and supraorbital crests well developed. Size medium to large; build heavy; soles broad; ears not prominent; fur dense.

The usual color pattern is as follows: A narrow median white stripe extends from nose to nape; a white dorsal band beginning with a broad nuchal patch, and narrowing between the shoulders, divides into two lateral stripes, which continue to the tail and sometimes down its sides; the rest of the body is black; the tail is of mixed black and white hairs, the white ones much the longer; all the tail hairs are white at the base. (See Pl. II, fig. 1.)

Great variability is exhibited by the species inhabiting the eastern United States—*putida*, *elongata*, and *mesomelas*—which grade in color pattern from specimens wholly white above, including the tail, to specimens in which the only white areas are the frontal stripe and a dash on the nape. In the western species and in *C. mephitis* from Canada the variability is slight, and consists chiefly in the breadth of the body stripes and the amount of white on the tail. (See Pls. I, II, and III.) The white areas are often of a creamy hue, and are never mixed with black hairs, as they are in the hooded skunks (subgenus *Leucomitra*), and specimens in the black phase never show any trace of the white on the sides that is usual in the black phase of *Leucomitra*.

Descriptions of Species and Subspecies.

CHINCHA MEPHITIS (Schreber). Canada Skunk.

Viverra mephitis Schreber, Säugth., III, p. 444, tab. 121, 1776.
Viverra mephitica Shaw, Mus. Leverianum, p. 171, 1792 (part).
Viverra mephitis Oken, Lehrbuch der Naturg., p. 994, 1816.
Chincha americana Lesson, Nouv. Tabl. Règne Anim., Mamm., p. 67, 1842.
Mephitis mephitica Bangs, Proc. Boston Soc. Nat. Hist., XXVI, p. 533, 1895; Elliot, Synop. Mamm. N. A., Field Columbian Museum, Zool. Ser., II, p. 322, 1901 (part).

Type locality.—America.

Geographic distribution.—Eastern Canada—Nova Scotia, Quebec, and northern Ontario; west and north at least to Oxford House, Keewatin.

General characters.—Size large; *tail short and slender*, mixed black and white; markings constant; skull large and massive; palate ending in an even curve, *without notch or spine.*

Color.—The color pattern, which is quite constant, agrees with that described in the subgeneric diagnosis (p. 22). The white stripes are never very broad and are sometimes separated for their entire length, as in *C. notata*. They extend down the sides of the tail and project beyond its tip. (See Pl. II, fig. 1.)

Cranial characters.—Skull large and massive; *rostrum broad;* zygomata heavy, *not greatly expanded; mastoid processes not prominent;* braincase very broad; palate ending in an even curve, *without distinct notch or spine;* posterior border of palate usually slightly back of posterior alveoli of last molars. (See Pl. V, figs. 1 and 2.)

Measurements.[1]—Average of 7 adult males from Canada:[2] Total length, 613; tail vertebræ, 188; hind foot, 78. Average of 2 adult females from Canada:[2] 578; 165; 70. *Skull:* (See table, p. 44).

General remarks.—Until quite recently the specific name *mephitica* has been applied indiscriminately to all the skunks of eastern North America. In 1895, Mr. Outram Bangs[3] restricted the name to the form inhabiting the Hudsonian and Canadian zones,[4] and pointed out the characters which distinguish it from its congeners. Schreber's name *mephitis*, which has sixteen years' priority over Shaw's name *mephitica*, is strictly applicable to the Canada skunk (as shown by Bangs), since the tail is said to be half the length of the body, a proportion not found in any other of the eastern species. The specific name *mephitis* has been rejected by all recent authors on the ground that it is preoccupied by *Viverra memphitis*, Linn.; but as shown in the remarks on nomenclature (p. 18), the two names are quite distinct.

The Canada skunk is a large, stocky animal with a heavy skull and a very short tail that narrows gradually to the tip. It is most nearly related to *hudsonica* of the western plains, from which it differs in the slender tail, as well as in skull characters. From *putida* of the Atlantic States it differs in larger size, shorter tail, and constancy of markings. Skulls of females are considerably smaller than those of males, and are equaled in size by skulls of males in *putida*, but in other respects they maintain the characters assigned to the species.

Specimens examined.—Total number, 13, from the following localities:

Nova Scotia: Annapolis, 1; Digby, 1; Halifax, 1.
Quebec: Lake Edward, 4.
Ontario: Moose Factory, 1; North Bay, Lake Nipissing, 2; Little Pic River, Lake Superior, 1.
Keewatin: Oxford House, 1; Pine Lake, 1.

[1] All measurements are in millimeters.

[2] *Fide* Bangs.

[3] Proc. Boston Soc. Nat. Hist., XXVI, p. 533, 1895.

[4] Examination of a large number of specimens from northern New York and New England shows that *putida* is the form occupying the greater part of the Canadian zone.

CHINCHA HUDSONICA (Richardson). Northern Plains Skunk.

Mephitis americana, var. *hudsonica* Richardson, Fauna Boreali-Americana, I, Mamm., p. 55, 1829.

Mephitis mephitica, var. *occidentalis* Merriam, Ann. Rep. U. S. Geol. Surv. for 1872, p. 662, 1873.

Mephitis mephitica hudsonia Elliot, Synop. Mamm. N. A., Field Columbian Museum, Zool. Ser., II, p. 322, 1901 (part).

Type locality.—Plains of the Saskatchewan.

Geographic distribution.—Western Canada, from Manitoba to British Columbia (east of the Cascades); south in the United States to Colorado, Nebraska, and Minnesota.

General characters.—Size very large; *tail heavy* and of medium length, *ending in a blunt brush without a white pencil;* skull heavy, with a long palate; *zygomata broadly spreading.*

Color.—This species exhibits the usual color pattern of skunks of this group. The white stripes are of medium width, bifurcate just behind the shoulders, and extend nearly to the tip of the tail. The tail, which is very full and bushy, usually ends in a blunt, black brush, and has an indistinct band of white about two-thirds of the distance from the root to the tip.

Cranial characters.—Compared with *mephitis:* Skull both longer and broader; *zygomata very widely expanded;* mastoid processes prominent; *palate long*, ending behind plane of posterior molars, without notch or spine; interorbital constriction marked; nasals and ascending branches of premaxillæ short; dentition heavy, the lower carnassial relatively large. (See Pl. VI, figs. 1 and 2.)

Measurements.—Average of three adult males from Saskatchewan, Montana, and Wyoming: Total length, 726; tail vertebræ, 268; hind foot, 82. Average of 3 adult females from Montana and Idaho, 602; 250; 71. *Skull:* (See table, p. 44).

General remarks.—This skunk may be readily distinguished from the skunks of the eastern States by its large size and bushy tail without a distinct white pencil. Compared with *mephitis*, its nearest ally, it has a longer and heavier tail, broad, heavy soles, and a skull of quite different proportions. The most noticeable difference between the skulls of the two species is in the widely spreading zygomata of *hudsonica* and the contracted mastoids of *mephitis*. The skull of *hudsonica*, viewed from above, appears narrower than that of *mephitis* in the frontal and parietal regions. It resembles that of *occidentalis* in general shape, but has more widely expanded zygomata. Typical *hudsonica* may be distinguished from both *varians* and *occidentalis* by the short ascending branches of the premaxillæ.

The species has an extensive range on the northern plains, and spreads over most of the northern portions of the Rocky Mountains from Colorado to British Columbia. Its range meets that of *mephitis* in Manitoba, and the two species may possibly intergrade, though

present material does not fully show that such is the case. Specimens from British Columbia have slightly shorter tails, but in other respects are typical.

A large series from Arkins, Colorado, consisting of skulls and a few skins, show that two species are present in that region. Of 31 skulls of adult males, 16 are fairly typical *hudsonica*, 12 are just as typical *varians*, and 3 are indeterminate. It is not difficult to separate them, the *hudsonica* series having broad, heavy skulls, with spreading zygomata and long palates, the *varians* series much slenderer and narrower skulls, with shorter palates. No skins of the *hudsonica* form are available, but those of the *varians* form are typical, except that they have the shorter tails usual in specimens of *varians* from the northern part of its range. Under these rather unusual conditions it seems hardly possible to consider that the two species intergrade, but rather that their ranges overlap at this point, each remaining distinct, save for an occasional hybrid.

Specimens examined.—Total number, 80, from the following localities:

Mackenzie: Great Slave Lake, 1.
Saskatchewan: Wingard, 1.
Alberta: Jasper House, 1.
British Columbia: Shuswap, 6; Sicamous, 4; Ashcroft, 1; Okanagan, 4; Kamloops, 1; Stuart Lake, 2; Ducks, 1.
Washington: Fort Spokane, 1.
Idaho: Bear Lake (east side), 1; Cœur d'Alène, 1.
Montana: Stanford, 1; Great Falls, 1; St. Marys Lake, 1; Nyack, Teton Mountains, 1; Bear Paw Mountains, 3; Prospect Creek, near Thompson, 1; Tobacco Plains, 2; Yellowstone River, (26 miles from mouth), 1.
Wyoming: Rona, Sheridan County, 1; Lower Geyser Basin, 1; Shoshone Lake, 1; Fort Bridger, 1; Big Horn Mountains, 1; Bull Lake Creek, Fremont County, 1; Fort Laramie, 1.
Colorado: Arkins, Larimer County, 19 (skulls).
Nebraska: Johnstown, 1.
South Dakota: Custer, 1; Fort Pierre, 1; Fort Randall, 1; Fort Sisseton, Marshall County, 1; Rapid City, 1.
Minnesota: Elk River, 9; Fort Snelling, 1; Roseau River, at Point d'Orme, 1; Bois de Sioux, 1.

CHINCHA PUTIDA (Boitard). Eastern Skunk.

Mephitis putida Boitard, Jardin des Plantes, Mamm., p. 147, 1842.
Mephitis olida Boitard, Jardin des Plantes, Mamm., p. 147, 1842.
Mephitis fetidissima Boitard, Jardin des Plantes, Mamm., p. 147, 1842.
Mephitis mephitica Baird, Mamm. N. Am., p. 195, 1857 (part); Elliot, Synop. Mamm. N. A., Field Columbian Museum, Zool. Ser., II, p. 322, 1901 (part).
Mephitis varians, var. *b. mephitica*, Gray, Cat. Carnivora Brit. Mus., p. 137, 1869.
Mephitis varians, var. *e. chinga*, Gray, Cat. Carnivora Brit. Mus., p. 137, 1869.

Type locality.—New Jersey.

Geographic distribution.—New England and Middle Atlantic States; south to Virginia; west to Indiana.

General characters.—Size medium; tail longer than that of *mephitis*,

black, *with a distinct white pencil;* skull short and relatively broad zygomatically, *with a prominent spine on the palate.*

Color.—This species exhibits the usual color pattern of the skunks of this group, with considerable variation in the breadth and extent of the white stripes. The tail is usually wholly black, excepting a white pencil, which extends from 100 to 150 mm. beyond the end of the vertebræ. The white stripes are usually broader than in *mephitis*, and specimens frequently occur in which the back is almost wholly white. In many individuals, however, the stripes are much reduced both in length and breadth, and occasionally are entirely wanting, the white being confined to a small patch on the nape and the usual frontal stripe. Only two individuals in the large series examined have the white stripes continued down the sides of the tail. (See Pl. I, fig. 1.)

Cranial characters.—Skull of medium size and *relatively broad across zygomata;* interorbital constriction marked; *posterior border of palate with a prominent spine;* palate usually ending about on a line with last molars; *mastoid processes prominent.* (See Pl. V, figs. 3 and 4).

Measurements.—Average of 6 adult males from Hastings, New York: Total length, 575; tail vertebræ 229, hind foot 60. Average of 6 adult females from same locality: 603; 223; 62. *Skull:* (See table, p. 44).

General remarks.—This species, the common skunk of the Eastern States, is generally distributed from Maine to Virginia, but reaches the Mississippi Valley only, so far as known, in Ohio and eastern Indiana. It has long borne the specific name *mephitica*, which until recently it shared with all its congeners in eastern North America; but since this is a synonym of *C. mephitis* (Schreber), which is here adopted for the Canada skunk, it becomes necessary to select the next available name. While a great many names were proposed in the early years of the present century for the American skunks, the earliest used in a sufficiently restricted sense to be available for the present species is *putida* of Boitard, proposed in 1842 for the skunk of New Jersey. There is but one species of skunk in New Jersey: hence, although Boitard's description is not in itself sufficient for identification, no doubt can exist as to the applicability of the name. The two other names (*olida* and *fetidissima*) proposed by him on the same page probably apply also to this form, but these are also inadequately described and lack the specific mention of a type locality.

In 1896 Bangs described a new form from Louisiana under the name *Mephitis mephitica scrutator* (=*mesomelas*), and expressed the opinion that the skunks inhabiting the New England and Middle Atlantic States are intermediates between it and *mephitica* (=*mephitis*).[1] A careful study of a large number of specimens from eastern North America, including Bangs's types, shows that the skunks of the Atlantic coast States are very distinct from those inhabiting the

[1] Proc. Biol. Soc. Wash., X, pp. 139–144, 1896.

Mississippi Valley, and that the form from New England and the Middle Atlantic States is also quite distinct from *mephitis*. Hence it is entitled to separation as a full species.

It may be at once distinguished from *mephitis* by its longer tail and very different skull. The skull is not only much smaller and weaker than that of *mephitis*, but the relatively great breadth across the zygomata and the marked interorbital constriction give it a very different appearance. The skulls of some of the largest males are almost as broad zygomatically as those of *mephitis*, though very much shorter. The spine on the posterior border of the palate, which is a fairly constant character (absent in only a very few individuals in the large series examined), distinguishes *putida* alike from *mephitis* and from *mesomelas* and its subspecies *avia*. The presence of a palatal spine, the great mastoid breadth, and other differences in the skulls of males of this species, as compared with those of *avia*, whose range meets that of *putida* in Indiana, show that the two forms are quite distinct. Skulls of females, however, have the spine on the palate less pronounced, the zygomata less abruptly spreading, and the mastoid processes reduced, and thus resemble rather closely the females of *avia*.

As in all the skunks, the skulls of the females of *putida* are very much smaller than those of the males, although occasionally the skull of a very large female will equal that of a small male. The skulls show a large amount of individual variation, particularly in size but also in other respects. Specimens from New Hampshire and northern New York average larger than the typical form, which might be regarded as due to the influence of *mephitis* but for the complete absence of other signs of intergradation with that species.

Specimens examined.—Total number, 182, from the following localities:

New York: Adirondack Mountains, 51 (skulls); Lake George, 10; Tomhannock, 1; Locust Grove, 11; Severance, 13 (skulls); Catskill Mountains, 1; Hastings-on-Hudson, 16; Highland Falls, 3; Big Moose Lake, Hamilton County, 1; Mayville, 2; Westchester County, 1; Sing Sing, 3; Montauk Point, 2; Shelter Island, 19 (skulls); Miller Place, Suffolk County, 2.
New Hampshire: Ossipee, 8.
Maine: Bucksport, 1; Brooklin, 2.
Massachusetts: Wilmington, 15; Burlington, 2; Taunton, 1; Ipswich, 1; Woods Hole, 2.
Connecticut: East Hartford, 3.
Pennsylvania: Carlisle, 1.
Ohio: Garrettsville, 1.
Indiana: Marion County, 3; Boone County, 1; Denver, 1.
Maryland: Jefferson, 1.
District of Columbia: Washington, 3.

CHINCHA ELONGATA (Bangs). FLORIDA SKUNK.

Mephitis mephitica elongata Bangs. Proc. Boston Soc. Nat. Hist., XXVI, p. 531, 1895.
Mephitis elongata Bangs, Proc. Biol. Soc. Wash., X, p. 142, 1896.

Type locality.—Micco, Brevard County, Florida.

Geographic distribution.—Florida (from vicinity of Lake Worth) to North Carolina, and in the mountains to West Virginia; west on the Gulf coast to the Mississippi River.

General characters.—Size medium; *tail very long*, marked with white on the sides, and with a long white pencil; markings variable, but white stripes usually very broad; skull peculiar—larger than that of *putida*.

Color.—Markings similar to those of *putida*, but white stripes averaging broader (about 45 mm. in width) and bifurcating about the middle of the back; tail mostly white above and on the sides, this color reaching around and almost meeting beneath the root of the tail. Great variability in markings is exhibited, some specimens being wholly black, save for a few irregular white patches on the shoulders, others nearly all white above, including the tail, and mixed with white below. (See Pl. I, figs. 2 and 3.)

Cranial characters.—Skull larger and heavier than that of *putida; highly arched in frontal region; rostrum very broad;* anterior palatine foramina large; zygomata spreading less abruptly; dentition heavy, lower carnassial especially large; audital bullæ rather large; spine on palate prominent; interpterygoid fossa broad.

Measurements.—Average of 2 adult males from type locality: Total length, 703; tail vertebræ, 317; hind foot, 74. Average of 2 adult females from St. Marys, Georgia: 710; 315; 73. A series from Lake Harney and Mullett Lake are somewhat smaller, 3 adult males averaging 689; 292; 64. *Skull:* (See table, p. 44.)

General remarks.—The Florida skunk is closely related to *putida*, but is very distinct from *mesomelas* of the lower Mississippi Valley, from which it may be distinguished by its long tail and heavy skull. It was described by Bangs as a subspecies of the eastern skunk, but in a later paper he accorded it specific rank, and stated that its range does not meet that of *mephitica* (=*putida*) on the Atlantic coast, since the coastal region of North Carolina is practically uninhabited by skunks. More recently Mr. Bangs has received a specimen of *elongata* from Raleigh, North Carolina, the only one, so far as known, ever taken in the eastern part of the State. Two specimens from West Virginia are typical except that the tail is not quite the usual length—a character found occasionally even in specimens from Florida.

Specimens examined.—Total number, 39, from the following localities:

Florida: Micco, 2; New Berlin, 2; Blitches Ferry, Citrus County, 3; Lake Harney, 5; Mullett Lake, 5; Gainesville, 1; Sebastian, 1; Fort Kissimmee, 3; Lake Worth, 1; Hernando County, 1.
Alabama: Baldwin County, 2.
Mississippi: Bay St. Louis, 2.
Georgia: St. Marys, 2; Pinetucky, 2; McIntosh County, 1; Nashville, 1.
North Carolina: Raleigh, 1; Weaverville, 2.
West Virginia: Green Bank, 1; Travellers Repose, 1.

CHINCHA MESOMELAS (Lichtenstein). Louisiana Skunk.

Mephitis mesomelas Licht., Darst. Säugeth., pl. 45, fig. 2, with accompanying text, 1832.
Mephitis mephitica scrutator Bangs, Proc. Biol. Soc. Wash., X, p. 141, 1896; Elliot, Synop. Mamm. N. A., Field Columbian Museum, Zool. Ser., II, p. 324, 1901.

Type locality.—Louisiana.

Geographic distribution.—West side of Mississippi Valley from southern Louisiana to Missouri; westward along the coast of Texas to Matagorda Island; and up the Red River Valley as far at least as Wichita Falls.

General characters.—*Size very small;* tail short, usually wholly black; skull small and relatively narrow.

Color.—More variable than *varians*, but apparently less so than *putida*. In specimens from the type locality the white stripes are narrow, and usually terminate about the middle of the back, though they occasionally extend to the root of the tail;[1] tail usually wholly black; the white pencil generally absent, but if present, shorter than in *putida*. (See Pl. II, fig. 2.) In specimens from Texas the stripes usually reach to the tail, and the coloration is more constant.

Cranial characters.—*Skull very small and relatively narrow; mastoids contracted;* palate ending squarely, *without distinct spine;* teeth small; audital bullæ usually more inflated than in *putida*. (See Pl. VI, figs. 3 and 4.)

Measurements.—Average of 4 adult males from Louisiana: Total length, 576; tail vertebræ, 223; hind foot, 63. Average of 3 adult females from same localities: 566; 224; 62. Average of 4 adults (both sexes) from Marble Cave, Missouri: 628; 232; 67. *Skull:* (See table, p. 44.)

General remarks.—In Lichtenstein's original description of this species he remarked that his type was secured from a natural history dealer, and was said to have come from Louisiana. In a later paper[2] he gave its range as '*Ludoviciana et ad Missouri fluvium.*' By reason of his assignment of a definite type locality, and by the aid of the measurements of his specimen,[3] we are able to apply the name with certainty to the small species inhabiting the lower Mississippi

[1] Lichtenstein figures a specimen in which the white stripes reach to the tail and down its sides. None of those examined from Louisiana have as much white as this specimen, but it is stated by Mr. Levi Spalding, of Iowa, Louisiana, that all gradations of color occur in the skunks of that section. When more specimens are obtained from the State, many individuals will probably be found that agree perfectly with the figure of the type.

[2] Abh. Akad. Wiss. Berlin for 1836, p. 277, 1838.

[3] His measurements are: Head and body, 1 ft. 7 in.; tail, 9 in.; hind foot, 2 in. Reduced to millimeters (assuming that he used the Rhineland foot) these measurements are as follows: Total length, 733; tail vertebræ, 235; hind foot, 52; which do not differ radically, except in length of body, from measurements of specimens recently taken in Louisiana. The great length of body was undoubtedly due to stretching of the skin.

Valley. The hairy soles ascribed by him to this species have not been observed in any species of the genus.

The Louisiana skunk was later described by Bangs as a subspecies of '*mephitica*' (= *mephitis* and *putida*). With *mephitis* it apparently has no connection; from *putida* it may be distinguished by its small size, short tail, and narrow skull with square palate. These characters also distinguish it from *elongata*. In most of the specimens examined the tail ends in a blunt black brush, as in *varians* and *hudsonica;* but a few from both extremes of its range have a slender white pencil, shorter than in *putida*. One specimen from Marble Cave, Missouri, is nearly all white above, including the tail. The shape and size of the anterior palatine foramina are variable in this species, some individuals having the large rounded foramina which appear in the subgenus *Leucomitra*.

Specimens examined.—Total number, 39, from the following localities:

Louisiana: Cartville, Acadia Parish, 2; Point aux Loups Springs, 5; Calcasieu Parish, 11; Calcasieu Pass, 1.

Texas: Matagorda Peninsula, 3; Virginia Point, 1; San Antonio, 3; Aransas County, 1; Gainesville, 2; Henrietta, 1; Wichita Falls, 1.

Oklahoma: Fort Cobb, Washita River, 1.

Missouri: Marble Cave, Stone County, 7.

CHINCHA MESOMELAS AVIA (Bangs). Illinois Skunk.

Mephitis avia Bangs, Proc. Biol. Soc. Wash., XII, p. 32, 1898.

Type locality.—San Jose, Illinois.

Geographic distribution.—Prairie region of Illinois, western Indiana, and eastern Iowa; boundaries of range imperfectly known.

General characters.—Resembles *mesomelas* very closely, but skull slightly larger.

Color.—The series from the type locality is variable; in some the white stripes terminate about the middle of the back, in others they reach to the root of the tail. Tail wholly black, with or without a white pencil.

Cranial characters.—Skull slightly larger than that of *mesomelas;* zygomata more widely expanded; upper carnassial large; palate variable in length, ending sometimes in front of and sometimes behind plane of last molars.

Measurements.—Average of two adult males from type locality:[1] Total length, 641; tail vertebræ, 184; hind foot, 65; one adult female from Freeport, Illinois: 610; 220; 68.[2] *Skull:* (See table, p. 44).

General remarks.—This form is very closely related to *mesomelas* from which it differs chiefly in greater size and perhaps shorter tail.

[1] *Fide* Bangs.

[2] These measurements, taken in the flesh from a specimen which died in the National Zoological Park, show that the species may have a somewhat longer tail than Bangs's measurements indicate, and not appreciably shorter than that of *mesomelas*.

While its range meets that of *putida* in Indiana intergradation seems not to take place. The differences between *avia* and *putida* have already been pointed out (see p. 27).

Specimens examined.—Total number, 10, from the following localities:

Illinois: San Jose, 6; Freeport, 1; 'Illinois,' 1.
Indiana: Fowler, Benton County, 1.
Iowa: Delaware County, 1.

CHINCHA MESOMELAS VARIANS (Gray). LONG-TAILED TEXAS SKUNK.

Mephitis varians Gray, Charlesworth's Mag. Nat. Hist., I, p. 581, 1837.
Mephitis macroura Aud. & Bach., Quad. N. Am., III, p. 11, 1854 [not *M. macroura* Licht.].
Mephitis mesomelas Allen, Bull. Am. Mus. Nat. Hist., VI, p. 188, 1894 [not *M. mesomelas* Licht.]; Elliot, Synop. Mamm. N. A., Field Columbian Museum, Zool. Ser., II, p. 325, 1901 [not *M. mesomelas* Licht.].

Type locality.—Texas (specimens from lower Rio Grande Valley considered typical).

Geographic distribution.—Southern and western Texas, eastern New Mexico, and adjacent parts of Mexico; north into Oklahoma, Colorado, Kansas, and Nebraska.

General characters.—Size large; *tail very long;* markings similar to those of *hudsonica*, constant; skull longer than that of *mesomelas.*

Color.—Similar to that of *hudsonica;* white stripes narrower than in *estor;* tail ending in a black brush *without* a pencil; white hairs intermixed in the tail, usually showing prominently in upper surface to about the middle of the tail, where they form an indistinct band.

Cranial characters.—Skull of medium size, smaller and narrower than that of *hudsonica;* longer than that of *mesomelas;* zygomata spreading less abruptly, and palate averaging shorter than in *hudsonica;* ascending branches of premaxillæ very long.

Measurements.—Average of 4 adult males from vicinity of Brownsville, Texas: Total length, 758; tail vertebræ, 393; hind foot, 71. Average of 4 adult females from lower Rio Grande Valley (Laredo and vicinity): 681; 376; 69. *Skull:* (See table, p. 44.)

General remarks.—In Gray's original description of this species he remarks that it inhabits Texas, and in a later paper mentions that the tail is as long as the body.[1] Two forms are found in Texas, either of which might be the subject of the original description, but only one of these, the larger, has a tail as long as the body. To this form, therefore, the name is restricted.[2]

[1] Cat. Carnivora Brit. Mus., p. 136, 1869.

[2] Dr. J. A. Allen has endeavored to fix Lichtenstein's name, *mesomelas*, to this form (Bull. Am. Mus. Nat. Hist., VI, p. 188, 1894), but that this can not be done is evident upon comparing the measurements of this species with those of *mesomelas* as given by Lichtenstein (see footnote p. 29). The specimens on which Dr. Allen based his views came from Oklahoma and belong to the large form—not the small one, of whose presence in Louisiana he was at the time unaware. The body and tail measurements made by him from dry skins, do not correctly represent the average measurements of *varians;* but the size and characters of the skull leave no doubt as to the identity of the specimens.

The species varies greatly in size: thus specimens from the lower Rio Grande Valley have much longer tails and rather smaller skulls than those inhabiting central Texas, Oklahoma, and Colorado. In southeastern Texas, in the vicinity of Matagorda Bay, it intergrades with *mesomelas*, whose range extends westward along the coast from Louisiana. In a series of 7 specimens from O'Connorport (opposite Matagorda Island), which are evidently intermediate, the markings are like those of *varians* while the skulls are small like those of *mesomelas*, and the tails average 312 mm.—much longer than the average tail measurement of *mesomelas*. Seven skins from Mason, Texas, show much more white than typical specimens, in this respect approaching *estor*, from which some of them can be distinguished only by greater size and longer tail. More than half of these Mason skins have the white hairs of the tail extending beyond the tip, and some have a distinct white pencil.

Specimens examined.—Total number, 139, from the following localities:

Tamaulipas: Matamoras, 2; Mier, 1.

Texas: Brownsville, 7; Corpus Christi, 1; Nueces Bay, 2; Santa Tomas, 1; Hidalgo, 2; Rio Grande City, 1; Padre Island, 1; Laredo, 2; Eagle Pass, 3; Mouth of Pecos River, 1; Presidio County, 2; El Paso, 2; East Painted Cave, Valverde County, 1; Indianola, 1; O'Connorport, 7; Rockport, 3; Fort Richardson, Jack County, 1; Berne, 1; Mason 7; Gail, 1; Colorado, 5; Fort Clark, Kinney County, 1; Sherwood, 2; Langtry, 2; Pecos High Bridge (Southern Pacific R. R.), 2; Chisos Mountains, 1; Davis Mountains, 1.

New Mexico: Hall Peak, 2; Eddy, 1.

Oklahoma: Beaver River, Beaver County, 9.

Colorado: Arkins, Larimer County, 20; Chivington, 1; Cañon City, 1; Boulder County, 1; Costilla County, 2; Conrow, 1; Loveland, 1.

Kansas: Cedarvale, 1; Neosho Falls, 1; Trego County, 5; Long Island, 2; Onaga, 3.

Nebraska: Johnstown, 21 (skulls); Valentine, 1; Cherry County, 1; Loup Fork River, 1.

CHINCHA ESTOR (Merriam) Arizona Skunk.

Mephitis estor Merriam, N. Am. Fauna No. 3, p. 81, 1890.

Type locality.—San Francisco Mountain, Arizona.

Geographic distribution.—Arizona, western New Mexico, Sonora, Chihuahua, and northern Lower California; south in the Sierra Madre to southern Chihuahua; limits of range unknown.

General characters.—Size rather small; tail shorter than that of *varians; much white on body and tail;* skull resembling that of *varians*, but smaller.

Color.—White stripes on back very broad—almost confluent; posterior back wholly white in some specimens; tail of black and white hairs, the white longer and chiefly on the upper surface, where they

extend beyond and nearly conceal the black; white pencil at tip. (See Pl. II, fig. 3.)

Cranial characters.—Skull resembling that of *varians* in general shape but *smaller and slenderer;* palate ending about on a line with posterior molars, either square or with a very small notch; molars smaller than in either *varians* or *occidentalis;* anterior palatine foramina small and narrow. (See Pl. VII, figs. 3 and 4.)

Measurements.—Average of 7 adult males from Arizona and adjacent parts of Mexico: Total length, 639; tail vertebræ, 285; hind foot, 69. Average of 4 adult females from same localities: 580; 273; 63. *Skull:* (See table, p. 44.)

General remarks.—The Arizona skunk is a very distinct species inhabiting Arizona, New Mexico, and adjacent parts of Mexico. In southern Arizona and Chihuahua its range overlaps that of *milleri*, the two species being often found at the same place. By reason of this fact, and on account of the extreme variability of *milleri*, the two have been frequently confused by authors, and many references to *estor* really apply to *milleri*. There need be no difficulty, however, in distinguishing them, either by skin or skull. The hooded skunks (to which group *milleri* belongs), while extremely variable, are usually either wholly black or wholly white on the back, and never have the two white stripes of *Chincha;* the tail is longer than the head and body (about 52 per cent of the total length). *Estor* is rather constant in markings, and has the white stripes of the other United States species inclosing a small patch of black, while the tail is shorter than the head and body (about 44 per cent of the total length). In the few cases in which *estor* has the whole back white, the purity of the white will serve to distinguish it from *milleri*, in which the white is of a grayish hue, due to the intermixture of black hairs. The very pronounced skull characters distinguishing the two groups are pointed out under the description of the subgenus *Leucomitra* (p. 39).

Estor differs from both *varians* and *occidentalis* in smaller size and shorter tail, and in the much greater extent of white on its body and tail. Specimens from the Mexican boundary line at the west base of the San Luis Mountains are somewhat larger than the typical form of *estor*, and one of them is plainly referable to *varians*, so it is possible that intergradation takes place between the two.

Specimens examined.—Total number, 55, from the following localities:

Arizona: San Francisco Mountain, 3; Springerville, 3; Holbrook, 1; Calabasas, 2; Yuma, 1; Fort Mohave, 1; Fort Verde, 12; Fort Huachuca, 1; Huachuca Mountains, 2; Huachuca Station, 1; Prescott, 1; Pinal County, 4; Whipple Barracks, 1.

New Mexico: Fort Wingate, 1; Cloverdale, Grant County, 1; Hachita, 1.

Sonora (near Mexican boundary line): Santa Cruz River, 1; San Pedro River, 1; Patagonia Mountains, 2; west side San Luis Mountains, 1; San Luis Springs, 1; Animas Valley, 1; San Bernardino Ranch (monument 77, Mexican boundary line), 1; La Noria (monument 111, Mexican boundary line), 1.

Chihuahua: White Water, 1; Cajon Bonita Creek (near Mexican boundary), 1; Colonia Garcia, 6; Sierra Madre (near Guadalupe y Calvo), 1.

Lower California: Poso Vicente, 1.

CHINCHA OCCIDENTALIS (Baird). California Skunk.

Mephitis occidentalis Baird, Mamm. N. A., p. 194, 1857.

Type locality.—Petaluma, California.

Geographic distribution.—Northern and central California, from vicinity of Monterey Bay northward, west of the Sierra and Cascades, to the Willamette Valley, Oregon.

General characters.—Size rather large; resembling *hudsonica* quite closely, but *tail longer; skull relatively narrow across zygomata;* palate rather long, sometimes with a distinct median notch.

Color.—Closely resembling *hudsonica* in pattern of coloration; white stripes of medium width, and frequently extending down sides of tail, though the white hairs never reach beyond the tip. The markings show little variation.

Cranial characters.—Compared with that of *hudsonica*, the skull of *occidentalis* is much *narrower across the zygomata, which spread less abruptly* and are more nearly parallel to the axis of the skull. Palate rather long, usually with a distinct median notch, though this is not always present, even in the typical form. The largest skulls of *occidentalis* equal those of *hudsonica* in length and in mastoid breadth, but the majority are somewhat shorter and narrower. (See Pl. VII, figs. 1 and 2.)

Measurements.—Type:[1] Total length, 800; tail vertebræ, 312; hind foot, 77. Average of 5 adult males from vicinity of San Francisco Bay: 693; 303; 78. One adult female from Auburn, California: 700; 330; 75. *Skull:* (See table, p. 44.)

General remarks.—The California skunk was recognized as distinct by Baird in 1857. With its four subspecies it forms a well-marked group, quite distinct from any of the eastern members of the genus, and has an extensive range. It equals *hudsonica* in size, but has a longer tail, and differs materially in cranial characters. The colors are very constant, but the skulls show great individual variation. The length of the tail is also variable, ranging from 265 to 370 mm. A series of skulls from Cassel, Shasta County, California, average larger than the typical form, and two specimens in the series are clearly intermediate between *occidentalis* and *major*. A specimen from Lake Tahoe likewise shows characters intermediate between

[1] *Fide* Baird.

these two forms. On the north intergradation with *spissigrada* is shown by a large series from Lake Cushman, Washington; while to the southward the typical form merges gradually into *holzneri*. Its relationships with *notata* and *platyrhina* are not clear, but intergradation with these is probable.

Specimens examined.—Total number, 107, from the following localities:

California: Petaluma, 1; Glen Ellen, 1; Novato, 1; Nicasio, 5; Point Reyes, 2; Mt. Tamalpais, 1; Fairfield, 2; Walnut Creek, 1; Santa Clara, 1; Salt Springs, Fresno River, 1; Wawona, 12 (skulls); Pine City, 7 (skulls); Yosemite Valley, 4; Mariposa County, 6 (skulls); South Fork Merced River, 1; Carbondale, 1; Hope Valley, Alpine County, 2; Markleeville, 1; Lake Tahoe, 2; Blue Canyon, 1; Auburn, 2; Tehama, 1; Red Bluff, 2; Sherwoods, 1; Cahto, 1; Cassel, Shasta County, 29 (skulls); Baird, Shasta County, 1; Shasta Valley, 2; Sisson, 2; Pitt River, Shasta County, 4; Fort Crook, Shasta County, 1; Big Valley Mountains, Lassen County, 1.
Oregon: Roseburg, 1; Eugene, 1; Grant Pass, Rogue River Valley, 5.

CHINCHA OCCIDENTALIS SPISSIGRADA (Bangs). PUGET SOUND SKUNK.

Mephitis spissigrada Bangs, Proc. Biol. Soc. Wash., XII, p. 31, 1898.
Mephitis fœtulenta Elliot, Field Columbian Museum, pub. 32, Zool. Ser., I, no. 13, p. 269, 1899.

Type locality.—Sumas, British Columbia.

Geographic distribution.—Shores of Puget Sound and coast region of Washington and northern Oregon.

General characters.—Resembling *occidentalis*, but with *shorter tail*, and more white on body and tail; *palate short*, without notch.

Color.—As in *occidentalis*, but body stripes very broad, and much white in tail. The white stripes bifurcate about the middle of the back (instead of between the shoulders as in *occidentalis*) and extend down the sides of the tail, the long white hairs frequently reaching beyond the tip. In most of the specimens examined the body stripes have a distinctly yellowish cast, but this is not a constant character. (See Pl. III, fig. 3.)

Cranial characters.—Skull similar to that of *occidentalis*, but *shorter, and relatively broader across zygomata;* rostrum averaging broader; bullæ slightly larger; *palate ending squarely*, with no trace of a notch, *even with last molars;* lower carnassial smaller; nasals long; ascending branches of premaxillæ very long and narrow.

Measurements.—Average of 3 adult males from type locality: Total length, 653; tail vertebræ, 246; hind foot, 79. Average of 2 adult females from type locality: 625; 235; 75. Average of 3 adult males from Neah Bay, Washington: 630; 230; 84. *Skull:* (See table, p. 44.)

General remarks.—This is a handsome skunk and is said to be very abundant, feeding in large numbers on the ocean beaches. It occupies a comparatively small area and is a strongly marked subspecies. Its

short tail and the great amount of white in the markings distinguish it from typical *occidentalis*. From *hudsonica*, it differs chiefly in its shorter palate, weaker and less abruptly spreading zygomata, and less mastoid breadth. Skulls of females of *spissigrada* and *hudsonica* bear a close resemblance to one another; those of the young may be distinguished by the longer nasals of *spissigrada*.

Since the original description of this form, additional material from the type locality shows clearly its relationship to *occidentalis* and establishes its identity with *fœtulenta* of Elliot. Specimens from the shores of the Olympic peninsula, on which *fœtulenta* was based, show the greatest extreme in the characters assigned, but the differences between them and specimens from Sumas are too slight to warrant even subspecific recognition. The slight notch in the palate exhibited by Elliot's specimens is due to the fact that they are all immature. In the comparisons on which the present results are based, a series of adult specimens from Neah Bay has been used. Specimens from Washington south of the Olympics are intermediate in characters between *spissigrada* and *occidentalis*, as is shown by the longer tail, longer skull, and notched palate.

Specimens examined.—Total number, 52, from the following localities:

British Columbia: Sumas, 6.

Washington: Neah Bay, 5; The Lagune, near Port Angeles, 3; Lapush, 1; Port Townsend, 1; Steilacoom, 5; Tenino, 2; Lake Cushman, 26 (skulls); Chehalis County, 2.

Oregon: McCoy, 1.

CHINCHA OCCIDENTALIS NOTATA subsp. nov. Cascade Skunk.

Type from Trout Lake, Mount Adams, Washington, ♂ adult, No. 87043, U. S. Nat. Mus., Biological Survey, Coll. Collected March 22, 1897, by Peter Schmid.

Geographic distribution.—Southern Washington and northern Oregon, east of the Cascades; exact limits of range unknown.

General characters.—Similar to *occidentalis*, but tail shorter; skull slightly larger and dentition heavier; *body stripes very narrow, and separated for their entire length.*

Color.—Similar to that of *occidentalis*, but body stripes much narrower (about 15 mm. broad in average specimens) and sometimes interrupted; usually, but not always, joined at nape, and not confluent anywhere else. Tail usually all black exteriorly, but sometimes with a little white on each side near the base. In the type and some other specimens, the body stripes terminate about the middle of the back. (See Pl. III, fig. 2.)

Cranial characters.—Skull slightly larger than that of *occidentalis;* palate ending nearly squarely, with no distinct notch; nasals short; *upper molars large*, often exceeding those of the largest specimens of *major; lower carnassial broad.*

Measurements.—Average of 3 adult males from type locality: Total length, 633; tail vertebræ, 249; hind foot, 76. Average of 5 adult females from The Dalles, Oregon: 659; 286; 69. *Skull:* (See table, p. 44.)

General remarks.—This form shows greater variability in markings than any other of the western skunks and is the only one in which the body stripes are ever interrupted. In skull characters it resembles *occidentalis* quite closely, but lacks the notch in the palate and has much larger molars. It probably intergrades with both *occidentalis* and *major*.

Specimens examined.—Total number, 41, from the following localities:

Washington: Trout Lake, Mount Adams, 31 (skins with skulls, 6; skulls only, 25); Rockland, Klickitat County, 1; Goldendale, 1.
Oregon: The Dalles, 8.

CHINCHA OCCIDENTALIS MAJOR subsp. nov. GREAT BASIN SKUNK.

Type from Fort Klamath, Oregon. ♂ adult, No. 92238, U. S. Nat. Mus., Biological Survey Coll. Collected Jan. 5, 1898, by B. L. Cunningham. Original number, 80.

Geographic distribution.—Eastern Oregon, northern California, and Nevada; east to the Wasatch Mountains in Utah.

General characters.—Similar to *occidentalis* but much larger; *hind foot longer; skull larger* and more heavily built.

Color.—Much as in *occidentalis:* white stripes broad, bifurcating near the middle of the back, and extending only a short distance on the tail, which is nearly all black exteriorly.

Cranial characters.—*Skull larger* and more heavily built than that of *occidentalis; rostrum broader and much flattened; braincase broader and not so deep*, thus giving a flattened appearance to the upper surface of the skull; dentition heavier; palate long, usually ending in a concave line, sometimes irregularly notched; ascending branches of premaxillæ short and broad.

Measurements.—Average of 5 adult males from type locality: Total length, 705; tail vertebræ, 306; hind foot, 84. *Skull:* (See table, p. 44.)

General remarks.—This subspecies seems to be the largest and heaviest skunk in the genus; the hind foot is both longer and broader than in any other member of the genus, and the front foot is correspondingly large. The large skull with its broad braincase readily distinguishes the form from its congeners. In the series from the type locality, the characters are constant, but the subspecies undoubtedly intergrades with *occidentalis* in northern California, and possibly with *notata* in northern Oregon. Specimens from western Nevada are provisionally included with *major*, although by reason of the fact that no males

have been examined—female skunks are less readily separable—their exact relationships are uncertain. Specimens from Ogden, Utah, are clearly referable to this form. Immature skulls of *major* may be distinguished from those of both *occidentalis* and *hudsonica* by the broad premaxillæ.

Specimens examined.—Total number, 27, from the following localities:

Oregon: Fort Klamath, 6; Tule Lake, 2; Plush, Lake County, 1; Shirk, Harney County, 1; Harney, 2; Elgin, 1.
Washington: Touchet, 1.
California: Lassen Creek, Shasta County, 1; Honey Lake, 1; Sierra Valley, 1.
Nevada: Carson, 1; Reno, 1; Quinn River Crossing, Humboldt County, 1.
Utah: Ogden, 6; Provo, 1.

CHINCHA OCCIDENTALIS HOLZNERI (Mearns). Southern California Skunk.

Mephitis occidentalis holzneri Mearns, Proc. U. S. Nat. Mus., XX, p. 461, 1897.

Type locality.—San Isidro Ranch, Lower California.

Geographic distribution.—Southern California, from vicinity of Monterey Bay south into Lower California; east to the Sierra Nevada and San Bernardino Range; limits of southward range unknown.

General characters.—Similar to *occidentalis* but smaller.

Color.—There are no appreciable color differences to distinguish this form from *occidentalis*. (See Pl. III, fig. 1.)

Cranial characters.—*Skull smaller* than that of *occidentalis* and *relatively narrow in mastoid region;* audital bullæ more circumscribed, but rather prominent; palatal notch usually absent.

Measurements.—Type (adult male):[1] Total length, 665; tail vertebræ, 273; hind foot, 72. Average of 3 adult males from Twin Oaks, San Diego County: 637; 292; 71. Average of 3 females (barely adult) from San Diego County: 605; 291; 64. *Skull:* (See table, p. 44.)

General remarks.—This form does not differ greatly from *occidentalis*, but averages considerably smaller in cranial measurements. The body and tail measurements of *holzneri* are slightly smaller than those of *occidentalis*, and the hind foot is decidedly shorter. Specimens from Ventura and adjacent counties are intermediate between the two forms, having the long tail of *occidentalis*, but very small skulls.

Specimens examined.—Total number, 41, from the following localities:

Lower California: San Isidro Ranch, 3.
California: Dulzura, 3; Twin Oaks, 5; Witch Creek, 2; Unlucky Lake, San Diego County, 1; Pacific coast at Mexican boundary, 1; Santa Ysabel, San Diego County, 1; Santa Paula, 2; San Fernando, 1; Ventura River, 1; Santa Ynez Mission, 3; Gaviota Pass, Santa Barbara County, 2; San Emigdio, Kern County, 1; Morro, 1; San Luis Obispo, 3; San Simeon, 2; Monterey, 3; South Fork Kern River (25 miles east of Kernville), 1; Three Rivers, 5.

[1] *Fide* Mearns.

CHINCHA PLATYRHINA sp. nov. BROAD-NOSED SKUNK.

Type from South Fork of Kern River (25 miles east of Kernville), California, ♂ adult, No. $\frac{29284}{41351}$, U. S. Nat. Mus., Biological Survey Coll. Collected July 5, 1891, by Vernon Bailey. Original number, 2998.

Geographic distribution.—Known only from the type locality and from Owens Valley.

General characters.—Externally much like *occidentalis;* skull with peculiarly shaped zygomata and *very broad rostrum.*

Color.—Resembling *occidentalis:* white stripes of medium width, produced only a short distance on the sides of the tail; tail black externally, except for an indistinct band of white on the upper surface about $\frac{2}{3}$ the distance from base to tip. Specimens from Owens Valley have most of the tail hairs *chestnut* instead of black, exteriorly; and in one case most of the body is chestnut. This is probably due to fading.

Cranial characters.—Skull resembling that of *occidentalis*, but shorter and relatively broader; much flattened in frontal region; *rostrum very broad*—actually and relatively broader than in largest specimens of *occidentalis;* zygomata spreading less abruptly and in an even curve nearly parallel to the axis of the skull; palate nearly square, with only a very slight notch; audital bullæ small, and slightly inflated; tube of auditory meatus short; nasals short and broad.

Measurements.—Type (adult male): Total length, 750; tail vertebræ, 320; hind foot, 90. Average of 3 adult females from Owens Valley: 679; 332; 79. *Skull:* (See table, p. 44).

General remarks.—This species shows no marked characters of pelage to distinguish it from *occidentalis*, which it equals or exceeds in size, but its peculiar skull at once serves to separate it. As typical *holzneri* occurs at the type locality of *platyrhina*, it is evident that intergradation does not take place between the two species at this point. It is quite likely, however, that *platyrhina* intergrades with *major;* but until there is material available to show such intergradation, a binomial designation seems preferable. The skull resembles that of *major* in general shape, but is very much smaller, and relatively broader across the postorbital processes.

Specimens examined.—Total number, 9, from the following localities:

California: South Fork Kern River, 5; Owens Valley, 2; Owens Lake, 2.

Subgenus LEUCOMITRA.

LEUCOMITRA, *subgen. nov.* HOODED SKUNKS.

Type.—Chincha macroura (Lichtenstein). From mountains northwest of the City of Mexico.

Subgeneric characters.—Skull (Pl. VIII) short and broad; interpterygoid fossa narrowly U-shaped; palate without notch or spine;

anterior palatine foramina large and rounded; audital bullæ large and greatly inflated; tube of auditory meatus short; periotic region slightly inflated; mastoid processes and sagittal crest never greatly developed; zygomata never spreading abruptly, and often nearly parallel to the axis of the skull; interorbital constriction not marked; paroccipital processes directed outward and not sharply pointed; posterior margin of coronoid distinctly concave. Size medium to small; build much slenderer than that of *Chincha;* feet slender; tail very long; ears prominent; fur long and silky but not dense; hairs on the nape elongated and spreading sidewise, forming a sort of hood.

In addition to the characters given above, the hooded skunks differ radically from the large striped skunks (subgenus *Chincha*) in the pattern of coloration (see Pl. IV), and although they exhibit great individual variation, one description will answer for the three forms comprised in the subgenus.

Two patterns occur, one in which the upperparts are chiefly white, the underparts black; the other in which the upperparts are nearly all black, with narrow lateral stripes, and under surface of tail white. Between these two extremes are many intermediate phases. The frontal stripe is narrow and often absent.

In the *white-backed* phase a broad band of white begins between the ears and covers the whole back and upper surface of the tail, the long white hairs drooping gracefully from the sides and over the tip of the tail. This band is of varying width, but is never bifurcated as in true *Chincha*. There may or may not be a white lateral line separated from the dorsal band by a black area. The dorsal band is never of the deep creamy hue so frequent in the stripes of *Chincha*, but is composed of nearly pure white hairs with numerous black ones intermixed, and so is more or less distinctly grayish in effect. The lateral stripes, when present, are always without this mixture of black hairs.

The *black-backed* phase usually has the narrow frontal stripe, and may have the white hood, which, however, is often absent. The white lateral stripe is almost always present, though varying in width from an inch or more to a mere trace; it is frequently replaced by two narrow stripes on each side. The lower surface of the tail is usually white, though sometimes the whole tail is black externally.

As in the typical subgenus, the bases of the tail hairs in both phases are invariably white. Irregular white spots on the ventral surface of the body are frequent.

In some of its characters, this subgenus shows an approach toward the genus *Mephitis* (*Spilogale* of authors), particularly in the shape of the audital bullæ and the anterior palatine foramina. In the concave border of the coronoid it resembles the white-backed skunks (*Thiosmus*); but this is a character that sometimes appears in true *Chincha*. The parasites found occasionally in the skulls of all skunks are especially frequent in this subgenus.

Descriptions of Species and Subspecies.

CHINCHA MACROURA (Lichtenstein). Hooded Skunk.

Mephitis macroura Lichtenstein, Darst. Säugeth., pl. 46, with accompanying text, 1832.—Baird, Mamm. N. Am., 1857, p. 200. [Not *M. macroura* Aud. and Bach.]
Mephitis mexicana Gray, Charlesworth's Mag. Nat. Hist., I, p. 581, 1837.
Mephitis longicaudata Tomes, Proc. Zool. Soc. London, 1861, p. 280.

Type locality.—Mountains northwest of the city of Mexico.

Geographic distribution.—Highlands of central and southern Mexico; south to Guatemala.

General characters.—*Size medium;* coloration as in other members of the subgenus—extremely variable; skull with sagittal crest and mastoid processes well developed.

Color.—The description of the color given in the remarks on the subgenus will apply to this species, with the added note that quite a large proportion of the specimens examined are in the black phase, and that the white pencil is frequently absent. (See Pl. IV, fig. 1.)

Cranial characters.—*Skull of medium size* (for the subgenus): sagittal crest and mastoid processes (in adult males) well developed; molars small; anterior palatine foramina large and rounded; posterior margin of palate an even curve, ending on a line with last molars.

Measurements.—Average of 4 adult males from near the type locality (Querendaro, Nahuatzin, and Salazar): Total length, 623; tail vertebræ, 299; hind foot, 67. Average of 4 adult females from same localities: 594; 297; 60.5. *Skull:* (See table, p. 44).

General remarks.—This species was described by Lichtenstein in 1832, and his name has been very generally adopted by subsequent authors. His type came from the mountains northwest of the city of Mexico, and specimens from Salazar are considered typical. The Guatemala form has been described by Tomes under the name *longicaudata*, but specimens from the vicinity of Dueñas show that it is not separable from the typical form. The southern limit of range is unknown, but it will probably be found little south of the highlands of Guatemala. To the northward *macroura* grades imperceptibly into *milleri*.

Specimens examined.—Total number, 60, from the following localities:

Mexico: Tlalpam, 4; Amecameca, 1; Salazar, 2.
Hidalgo: Marques, 1; El Chico, 1; Irolo, 1; Encarnacion, 1; Zimapan, 1; Real del Monte, 1.
Michoacan: Querendaro, 4; Patzcuaro, 1; Nahuatzin, 2.
Colima: Colima, 4; Hacienda Magdalena, 1.
Jalisco: Ameca, 2; San Sebastian, 1.
Tepic: Santa Teresa, 1.
Zacatecas: Valparaiso, 1.
San Luis Potosi: Hacienda La Parada, 6.
Tamaulipas: Jaumave, 1.
Morelos: Cuernavaca, 5.

Puebla: Chalchicomula, 1; Tehuacan, 1; Piaxtla, 2.
Vera Cruz: Perote, 1; Las Vigas, 2; Jico, 4; Orizaba, 1.
Oaxaca: Oaxaca (mountains 15 miles west), 1.
Guatemala: Dueñas (vicinity), 5.

CHINCHA MACROURA MILLERI (Mearns). Northern Hooded Skunk.

Mephitis milleri Mearns, Proc. U. S. Nat. Mus., XX, p. 467, 1897.

Type locality.—Fort Lowell (near Tucson), Arizona.

Geographic distribution.—Southern Arizona, Sonora, and parts of Chihuahua, Sinaloa, Durango, and Coahuila.

General characters.—Very similar to *macroura* but averaging *larger, with heavier skull.*

Color.—Much as in *macroura*, with probably a larger proportion of the white-backed phase. In a series of 15 from Camoa, Sonora, 6 have black backs and 9 white backs. Two of the black-backed ones are with and 4 without the white hood; 1 is wholly black save for a trace of the side stripe and a very narrow frontal stripe. (See Pl. IV, figs. 2, 3, and 4.)

Cranial characters.—*Skull averaging larger* than that of *macroura*, the greatest difference being in the length. Lower carnassial considerably larger, both in length and breadth. (See Pl. VIII, figs. 1 and 2.)

Measurements.—*Type* (an abnormally large specimen): Total length, 790; tail vertebræ, 435; hind foot, 73. Average of 7 adult males from Arizona and adjacent parts of Mexico: 672; 359; 65. Average of 7 adult females from same localities: 668; 357; 61. *Skull:* (See table, p. 44.)

General remarks.—The northern hooded skunk is a rather poorly marked subspecies of *macroura*, the two forms intergrading in central Mexico. The type is a greatly overgrown specimen, as is shown by comparison with a series of adults from near the type locality. Average specimens are somewhat larger than *macroura*, the tail usually exceeding 350 mm. in length and the skulls averaging larger, though it is possible to select specimens from both extremes of their combined range that are almost identical in cranial characters.

The most northern point at which the subspecies has been taken is Fort Grant, Graham County, Arizona, whence it spreads southward over northwestern Mexico, passing into the typical form in the central states of Mexico. Apparently it does not occupy northeastern Mexico, since it has not been recorded from the Rio Grande Valley or from the northern parts of Coahuila, Nuevo Leon, or Tamaulipas.

Specimens examined.—Total number, 55, from the following localities:

Arizona: Fort Lowell, 1; Nogales, 1; Fort Huachuca, 7; Fort Grant, Graham County, 2; Tucson, 1; Calabasas, 1; Fairbank, 2; Santa Catalina Mountains, Pinal County, 5.

Sonora: Patagonia Mountains, 1; Santa Cruz River, 3; Santa Cruz, 1; Hermosillo, 1; Magdalena, 1; Camoa, 15; Alamos, 1.
Chihuahua: Chihuahua, 3; Casas Grandes, 2; Guadalupe y Calvo (mountains near), 3.
Sinaloa: Sierra de Choix, 1.
Coahuila: Jimulco, 2; La Ventura, 1.

CHINCHA MACROURA VITTATA (Lichtenstein). Least Hooded Skunk.

Mephitis vittata Lichtenstein, Darst. Säugeth., pl. 47, with accompanying text, 1832.
Mephitis concolor Gray (Verreaux MS.?), Proc. Zool. Soc. London, 1865, p. 149.
Mephitis vittata var. *b. intermedia* Gray, Cat. Carnivora Brit. Mus., p. 138, 1869.
Mephitis vittata var *c. concolor* Gray, Cat. Carnivora Brit. Mus., p. 138, 1869.

Type locality.—'San Matteo el Mar,' Oaxaca, Mexico.

Geographic distribution.—Known only from the type locality; probably ranges over the coast region of Oaxaca and Chiapas.

General characters.—*Smaller than macroura*, with very small skull, and slightly developed mastoids and sagittal crest.

Color.—As in *macroura;* pencil not distinct. In the series of 18 topotypes examined, 5 are in the black phase.

Cranial characters.—*Skull decidedly smaller* than that of *macroura;* relatively narrow across zygomata, and *mastoids much reduced;* sagittal crest very slightly developed; *bullæ disproportionately large.* (See Pl. VIII, figs. 3 and 4.)

Measurements.—Average of 6 adult males from the type locality: Total length, 558; tail vertebræ, 275; hind foot, 60.4. Average of 12 adult females from the type locality: 585; 300; 59.5. *Skull:* (See table, p. 44.)

General remarks.—This form was described by Lichtenstein at the same time as *macroura*, and his description was accompanied by a good figure of a specimen in the black phase. The description is too meager in details, in the absence of material from the type locality, to clearly establish the validity of the subspecies, but all uncertainty has been removed by the fine series of specimens collected at San Mateo del Mar in 1895 by E. W. Nelson and E. A. Goldman. The form is well marked, differing more from *macroura* than does *milleri.* It is the smallest of the genus, and may be recognized by this fact as well as by its peculiar skull characters. The pelage is rather thin and coarse. The tail is relatively longer than that of *macroura.* Although, as usual, the males have the greater average skull measurements, yet in total length the average of the females is greater. A very large proportion of the skulls examined had been infested with parasites, and the distortion of the cranium through this cause is greater than in any other species examined. One specimen in particular has the swelling produced fully 7 mm. above the normal top of the cranium and spread to a width of 28 mm., although the mastoid breadth of the same specimen is but 31 mm.

Specimens examined.—Eighteen, all from the type locality.

Average cranial measurements of Chincha.

Species.	Sex.	Localities.	Basal length.	Basilar length of Hensel.[1]	Greatest zygomatic breadth.	Greatest mastoid breadth.	Breadth across post-orbital processes.	Least interorbital breadth.	Palatal length.	Post-palatal length.	Foramen magnum to plane of last molars.	Number of specimens averaged.
Chincha mephitis	♂	Lake Edward, Quebec	71.5	70	52	44	25.5	23	29.5	40.5	43	1
	♀	do	65	62.5	47	40.5	24	20.5	27	35.5	38.5	1
C. hudsonica	♂	Saskatchewan, Montana, Wyoming, and Nebraska	75.5	73.8	54.4	45	24.3	19	31	42.8	44.1	4
	♂	Sicamous and Shuswap, British Columbia	72.1	70.1	52.6	43.4	23.5	19.4	29.6	40.5	42.1	4
	♀	do	66.6	65	46.9	39.1	22.3	18.8	27.8	37.3	38.4	4
C. putida	♂	Westchester and Orange counties, New York	63.5	61.6	45.6	38.8	20.5	17.9	26.3	35.3	36.7	5
	♂	Adirondack Mountains, New York	66	63.6	47.7	40.8	21.5	19.2	26.3	37.3	38.5	5
	♀	Westchester County, New York	58.6	56.7	43.1	36.7	20.8	18	24	32.7	33.5	5
C. elongata	♂	Florida (peninsula)	65	62.9	47.4	38.9	22.3	20.3	27.2	35.7	37.1	5
	♀	do	60.8	58.9	44.6	37	21.5	19.7	25	33.9	35.1	5
C. mesomelas	♂	Louisiana	60.5	58.5	42.5	34.5	20.9	18.8	24.8	33.6	34.1	6
	♀	do	57.8	56	41.1	34.1	20.2	17.6	24.2	31.8	32.9	5
C. m. avia	♂	San Jose, Illinois	64.1	62.4	44.7	36.6	21.1	17.4	26.6	36	36	4
	♀	do	60.8	59	42	35.8	19.5	17.5	24.5	34.5	34.8	2
C. m. varians	♂	Southern Texas and Tamaulipas	64.6	62.5	45.2	37.5	22	19.1	26.6	36	37	7
	♀	Southern Texas	62.8	60.5	44.2	36.4	21.3	19.2	26	34.5	35.8	5
C. estor	♂	Arizona	62.2	60.2	44.3	36.2	20.7	18.2	25.3	34.8	35	3
	♀	Arizona and New Mexico	59.3	57.3	41.2	34.3	20.7	18.5	24.2	33.2	33	3
C. occidentalis	♂	Vicinity of San Francisco Bay, California	72.3	70	49.8	42.4	23.3	20.1	28.8	41.2	42.6	5
	♀	Nicasio and Monterey, California	65.3	62.7	44.7	37.8	21.3	18.5	27.7	35.3	36.8	3
C. o. spissigrada	♂	Sumas, British Columbia	68.8	66.8	50	41.5	23.5	18.9	28	38.8	39.8	2
	♂	Neah Bay, Washington	69.8	68.5	50.4	41	24	20	28	40.5	40.5	4
	♀	Sumas, British Columbia, and Neah Bay, Washington	67.5	66	48	40	22.5	20	27.5	38.5	39.5	

C. o. notata	♂	Trout Lake, Washington	73.1	71.2	52	44.9	23.7	19.7	30.2	41	42.9	7
	♀	.....do	66.1	64.5	45.4	39.4	20.9	18.6	27.8	36.7	37.8	5
C. o. major	♂	Fort Klamath, Oregon	75.3	73.5	52.6	45.8	24.1	20.8	30.5	43	44.6	4
	♀	Plush, Warner Lake, Oregon	67	65	47	41	23	21	27.5	38.5	39	1
C. o. holzneri	♂	Southern California and northern Lower California	66.9	64.5	47.4	38.7	22.2	19.1	27.3	37.2	38.9	7
	♀	Southern California	61.5	59.5	42.5	35.4	19.7	18.3	25.5	34	34.8	5
C. platyrhina	♂	Kern River and Owens Lake, California	69.2	67.7	48.7	40.7	24.7	19.8	29	38.7	40.7	3
	♀	Owens Valley, California	67	65	46.8	39	23.5	19.3	28.5	36.5	38.8	2
C. macroura	♂	Michoacan and Puebla, Mexico	56.3	54.5	42.2	34.4	21.2	(2)	22.9	31.6	31.8	8
	♀	Michoacan and Distrito Federal, Mexico	54.5	53.3	39.2	32.7	19.6	(2)	22.8	30.5	30.5	5
C. m. milleri	♂	Arizona and Sonora	60.3	58.4	43.9	36	22.3	19.4	24.1	34.2	33.8	7
	♀	Arizona	56.4	54.4	39.6	32.6	20.4	18.3	23.5	31	31.3	5
C. m. vittata	♂	San Mateo del Mar, Oaxaca	54.6	52.6	38.3	32.3	20.1	(2)	22	30.6	30.7	5
	♀	.....do	52.3	50.5	38.3	31.8	20.6	(2)	21.2	29.3	29.3	7

[1] See footnote, p. 21.

[2] On account of the diseased condition of these skulls this measurement could not be taken.

INDEX.

[New names in **black-face type**: synonyms in *italics*.]

PLATE I.

[Greatly reduced, and relative sizes not accurately shown, owing to differences in preparation of skins.]

FIG. 1. *Chincha putida* (Boitard). Burlington, Massachusetts. (No. 77878, U. S. Nat. Mus.)

2. *Chincha elongata* (Bangs). Fort Kissimmee, Florida. (No. 64017, U. S. Nat. Mus.)

3. *Chincha elongata* (Bangs). Fort Kissimmee, Florida. (No. 64016, U. S. Nat. Mus.)

SKINS OF CHINCHA.

1. *Chincha putida.* 2, 3. *Chincha elongata.*

PLATE II.

[Greatly reduced, and relative sizes not accurately shown, owing to differences in preparation of skins.]

FIG. 1. *Chincha mephitis* (Schreber). Pine Lake, Keewatin. (No. 107226, U. S. Nat. Mus.)

2. *Chincha mesomelas* (Licht.). Calca-ieu Parish, Louisiana. (No. 99831, U. S. Nat. Mus.)

3. *Chincha estor* (Merriam). Holbrook, Arizona. (No. 53209, U. S. Nat. Mus.)

SKINS OF CHINCHA.

1. *Chincha mephitis.* 2. *Chincha mesomelas.* 3. *Chincha estor.*

PLATE III.

[Greatly reduced, and relative sizes not accurately shown, owing to differences in preparation of skins.]

FIG. 1. *Chincha occidentalis holzneri* (Mearns). Three Rivers, California. (No. 31244, U. S. Nat. Mus.)

2. *Chincha occidentalis notata* Howell. Trout Lake, Mt. Adams, Washington. (No. 87042, U. S. Nat. Mus.)

3. *Chincha occidentalis spissigrada* (Bangs). Neah Bay, Washington. (No. 88650, U. S. Nat. Mus.)

SKINS OF CHINCHA.

1. *Chincha occidentalis holzneri.* 2. *Chincha occidentalis notata.*
3. *Chincha occidentalis spissigrada.*

PLATE IV.

[Greatly reduced, and relative sizes not accurately shown, owing to differences in preparation of skins.]

FIG. 1. *Chincha* (*Leucomitra*) *macroura* (Licht.). Perote, Vera Cruz. (No. 54225, U. S. Nat. Mus.)

2. *Chincha* (*Leucomitra*) *macroura milleri* (Mearns). Camoa, Sonora. (No. 95927, U. S. Nat. Mus.)

3. *Chincha* (*Leucomitra*) *macroura milleri* (Mearns). Camoa, Sonora. (No. 95923, U. S. Nat. Mus.)

4. *Chincha* (*Leucomitra*) *macroura milleri* (Mearns). Camoa, Sonora. (No. 95931, U. S. Nat. Mus.)

SKINS OF CHINCHA (LEUCOMITRA).

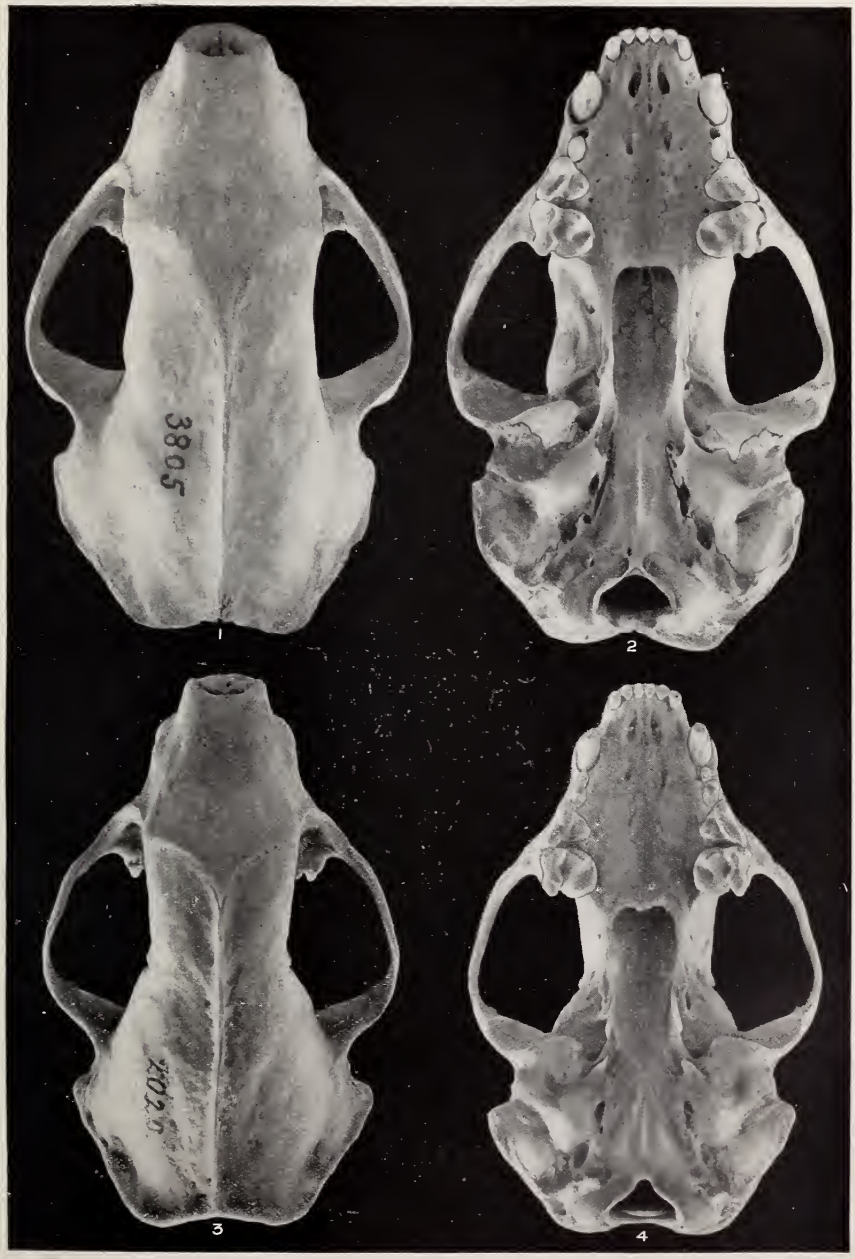
1. *Chincha macroura.* 2, 3, 4. *Chincha macroura milleri.*

PLATE V.

[Natural size.]

FIGS. 1 and 2. *Chincha mephitis* (Schreber). ♂, Lake Edward, Quebec. (No. 3805, Coll. E. A. & O. Bangs.)

3 and 4. *Chincha putida* (Boitard). ♂, Highland Falls, New York. (No. 2020, Am. Mus. Nat. Hist.)



SKULLS OF CHINCHA.

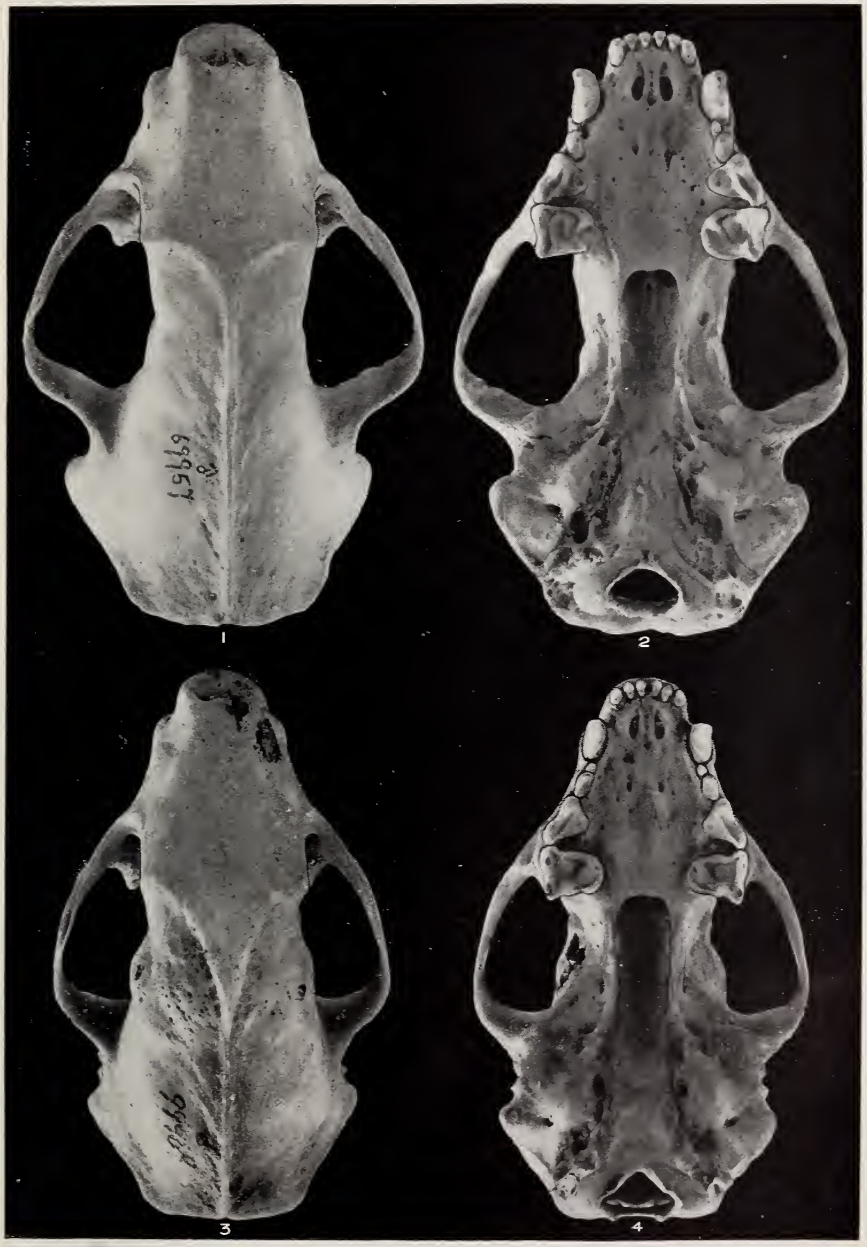
1, 2. *Chincha mephitis.* 3, 4. *Chincha putida.*

PLATE VI.

[Natural size.]

FIGS. 1 and 2. *Chincha hudsonica* (Richardson). ♂, Sicamous, British Columbia. (No. 69957, U. S. Nat. Mus.)

3 and 4. *Chincha mesomelas* (Licht.). ♂, Calcasieu Parish, Louisiana. (No. 99969, U. S. Nat. Mus.)



SKULLS OF CHINCHA.

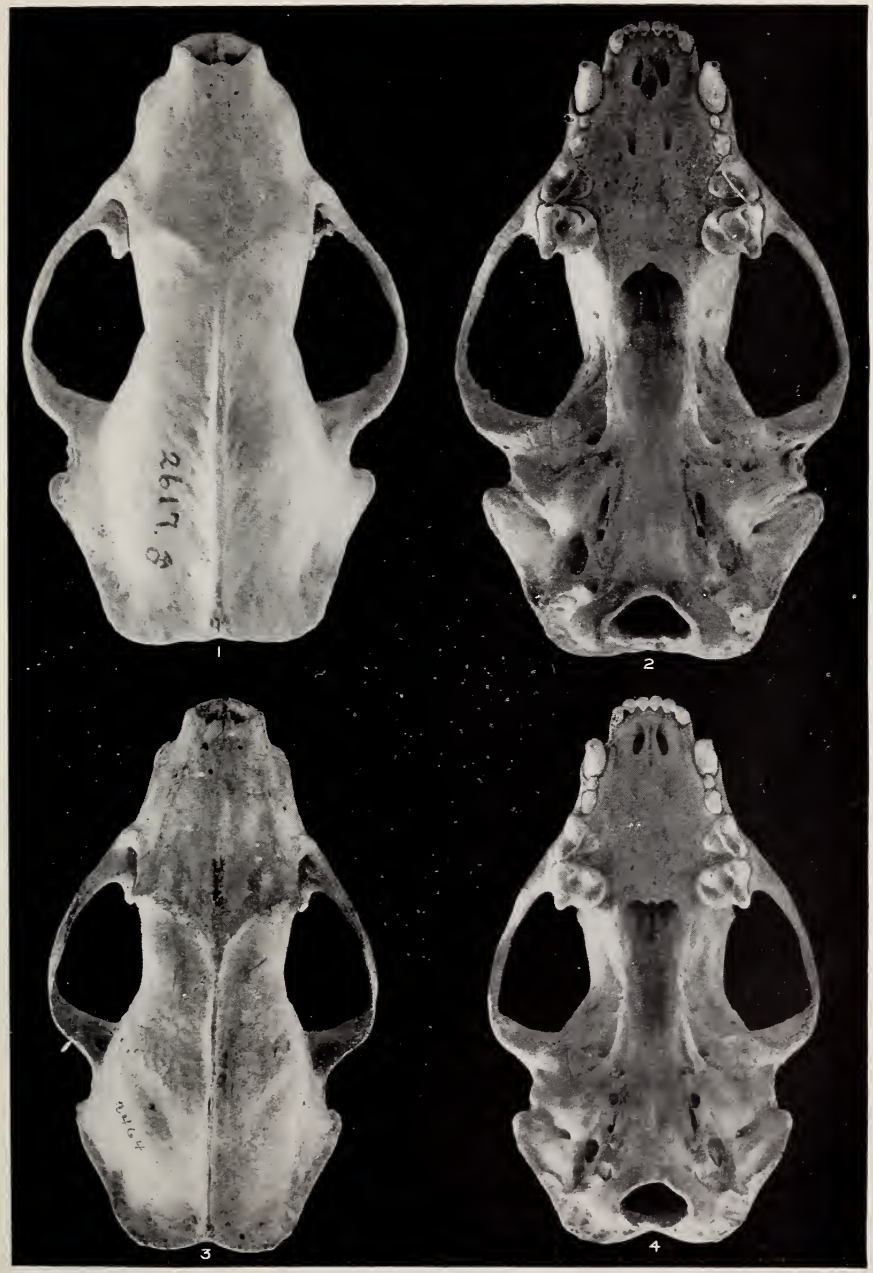
1, 2. *Chincha hudsonica.* 3, 4. *Chincha mesomelas.*

PLATE VII.

[Natural size.]

FIGS. 1 and 2. *Chincha occidentalis* (Baird). ♂, Type. Petaluma, California. (No. 2617, U. S. Nat. Mus.)

3 and 4. *Chincha estor* (Merriam). ♂, Type. San Francisco Mountain, Arizona. (No. 24645, U. S. Nat. Mus.)



SKULLS OF CHINCHA.

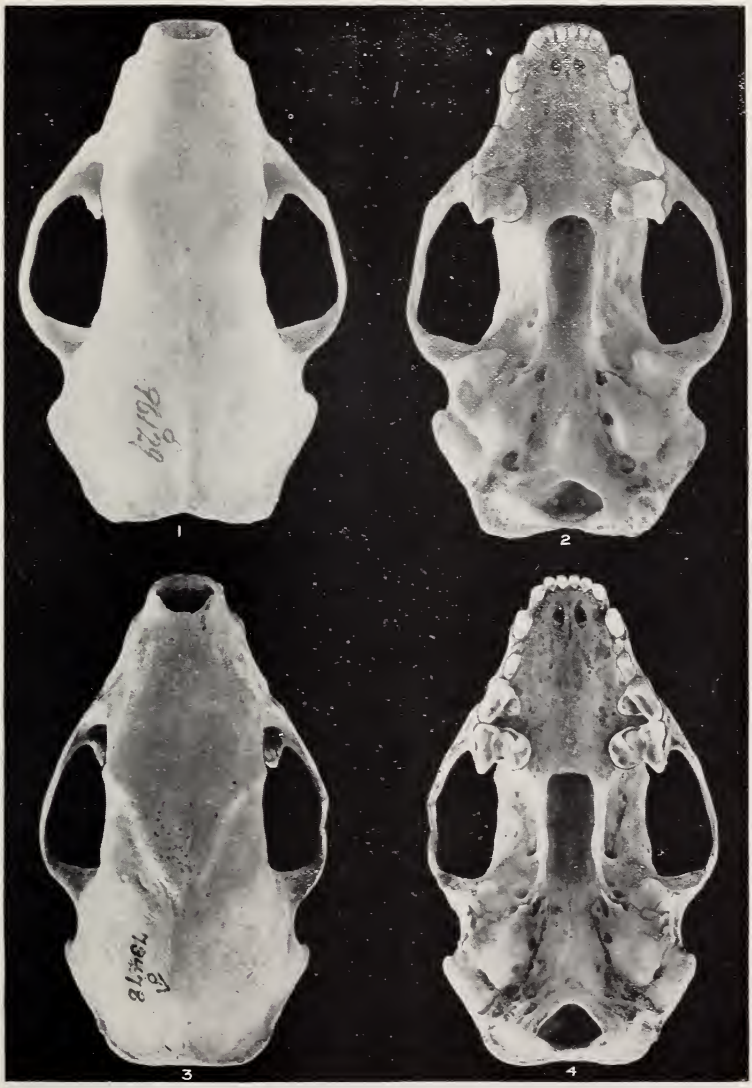
1, 2. *Chincha occidentalis.* 3, 4. *Chincha estor.*

PLATE VIII.

[Natural size.]

FIGS. 1 and 2. *Chincha* (*Leucomitra*) *macroura milleri* (Mearns). ♂, Fort Grant, Arizona. (No. 96129, U. S. Nat. Mus.)

3 and 4. *Chincha* (*Leucomitra*) *macroura vittata* (Licht.) ♂, San Mateo del Mar, Oaxaca. (No. 73478, U. S. Nat. Mus.)



SKULLS OF CHINCHA (LEUCOMITRA).

1, 2. *Chincha macroura milleri.* 3, 4. *Chincha macroura vittata.*