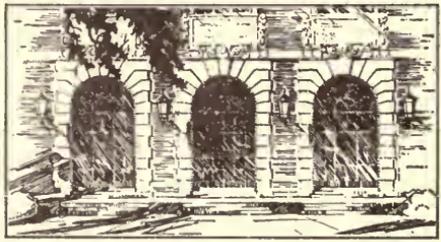


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VOLUME 60

A SURVEY OF THE MAMMALS OF AFGHANISTAN

RESULTING FROM THE 1965 STREET EXPEDITION
(EXCLUDING BATS)

JERRY D. HASSINGER

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VOLUME 60



FIELD MUSEUM OF NATURAL HISTORY
CHICAGO, U. S. A.

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(EXCLUDING BATS)

JERRY D. HASSINGER

Street Expedition Fellow (February, 1965 to July, 1966) and

Thomas J. Dee Fellow (August, 1966 to May, 1967)

Field Museum of Natural History

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INTRODUCTION

The present survey of 84 terrestrial mammal species known from or thought to occur in Afghanistan provides a compendious history of contributions, an account of each species including a map of records and estimated distribution, and a gazetteer of localities cited in text. It is based on a collection of 1,313 specimens contained in 58 species resulting from the 1965 Street Expedition, and on a critical review of publications and other collections.

Hassinger (1968) furnishes an introduction to the present paper and to the 1965 Street Expedition, its goals, organization, fieldwork, and preliminary results. The reader is referred to that introduction, especially to sections on physiography, climate, phytogeography, and mammal habitat.

Excluding bats, this survey summarizes most of what is known about Afghan mammals, and therein shows that knowledge of this fauna is fragmentary and for some species virtually nonexistent. Twenty species are either not found in museum collections or are poorly represented by a single specimen, a skull, or by skins purchased from a furrier. This volume will have served its purpose if, in calling attention to and delineating such deficiencies, it arouses a general awareness of the need for further research.

ACKNOWLEDGEMENTS

I am thankful for a second opportunity to offer in print my sincere and grateful appreciation to the following individuals and organizations whose contributions (acknowledged in Hassinger, 1968, pp. 11-12), in great measure, form the basis for the present work: the staff of Field Museum of Natural History and, particularly, Field Associates William S. Street and his wife Janice K. Street, Dr. Joseph C. Moore, former Curator, Division of Mammals, Expedition Fellow Hans Neuhauser, former staff artist Miss Marion Pahl, and Mrs. Dorothy Gibson, Supervisor, Herbaria; the International Harvester Company, especially Mr. and Mrs. Brian Reardon; and Dr. Robert E. Lewis and Mr. Sana Atallah of the American University of Beirut.

Political and logistical contributions of an adjuvant nature were not previously acknowledged. Without this valuable help access to Afghanistan and the freedom of movement enjoyed therein may have been denied the Street Expedition. In effect, the results presented in Hassinger (1968) and in the present paper are in no small part due to such efforts. The following list includes some of those to whom we are so indebted: American Ambassador John M. Steeves and his staff, notably Mr. Howard Ashford, Jr., and Mr. David Bergoon; Dr. A. G. Ravan Farhadi, Director General of Political Affairs in the Afghan Foreign Ministry; CARE, especially Frank Goffio, President, and Field Representatives Henry Selz and Don Ostrander; University of Kabul, namely, the Dean of the Faculty of Science, Dr. Kakhar.

Dr. J. C. Moore edited and re-edited each species account. Words seem inadequate to repay his devotion to this. To Dr. A. L. Rand, then Chief Curator of Zoology, Field Museum of Natural History, I offer special thanks for making valued suggestions and for critically examining the final manuscript. I accept responsibility for any error.

PREVIOUS COLLECTIONS

This section will survey all of the significant collections of Afghan mammals that have been reported in the literature, naming the collector, the year, nature of contribution, and general localities wherein specimens were obtained, but will not refer to a number of smaller collections. An important but unpublished collection of mammals made by members of the Third Danish Expedition to Central Asia (1948-1949) is included. Complete literature and locality records for each species found or purported to occur in Afghanistan will be given in the "Accounts of Species" section.

The first scientific collection of Afghan mammals was made between August, 1839 and October, 1840, by William Griffith, a British army surgeon and botanist. The limited number of mammals he collected went to the Indian Museum, Calcutta, and are known in the literature from Anderson (1881) and Selater (1891).

A few of Griffith's specimens eventually found their way from the Indian Museum to the British Museum, notably the single specimen of dwarf jerboa, *Salpingotus*, with the label: "Afghanistan, W. Griffith," which Vinogradov described as a new species in 1928. There is considerable controversy and speculation as to where in Afghanistan Griffith collected this species. Some scientists think he actually obtained it during his travels in Tibet. Griffith's itinerary and the most probable habitat of this saltatorial rodent, known only from the type, is described in the species account of *Salpingotus*.

Captain Thomas Hutton, an officer in the British army made the first extensive collection of terrestrial mammals in Afghanistan, and also reported on species not collected but said to occur in Afghanistan. He resided in Kandahar for two years, 1839 to 1841, and confined his observations largely to the vicinity of Kandahar and districts south of Ghazni. Hutton sent his specimens to Edward Blyth, curator of the Museum of the Asiatic Society of Bengal, and subsequently reported upon them as 28 species contained in 23 genera (Hutton, 1845, 1846).

Between October, 1880 and April, 1881 Lt. Col. Swinhoe assembled a second collection of mammals from the vicinity of Kandahar

and presented it to the British Museum where it was studied and published on immediately by Scully (1881).

British members of the Afghan Delimitation Commission collected the first series of mammals from northwestern Afghanistan in 1884-1886. A botanist, J.E.T. Aitchison, the naturalist of this Commission, left Quetta on September 21, 1884 to travel and collect through northern Baluchistan to the Helmand river, then west along the Helmand, through the Sistan and northward into western Afghanistan to the Hari Rud valley west of Herat, arriving in Kohsan on November 18, 1884. From Kohsan, Aitchison crossed the Parapamisus mountains south of Gulran and traveled east north east through Kushk reaching Bala Murghab December 14, 1884. He left Bala Murghab two months later, and, continuing his mammal collections, traveled extensively during the spring of 1885 in northwestern Afghanistan both north and south of the Parapamisus Mountains, in the Hari Rud valley, and even to Mashhad in northeastern Iran. Although Aitchison left the Delimitation Commission and Afghanistan about August 16, 1885, Capt. C.E. Yate, a commissioned officer attached to this mission, continued to collect mammals. Captain Yate collected in the vicinity of Herat, Bala Murghab, Maimana, and in the natural region called North Afghanistan.

The Aitchison and Yate collections were studied and published in two separate papers, which, with a few exceptions, report on nearly duplicate sets of mammals. Captain Yate presented his collection to the Indian Museum and J. Scully (1887) published upon it as 13 species. The mammals collected by J.E.T. Aitchison went to the British Museum where they were identified and described by Oldfield Thomas (*in* Aitchison, 1889) as 16 species of 13 genera collected, and seven other species of seven other genera observed but not taken.

The foregoing assemblages of mammal specimens, all made by British military personnel whose major natural history interests were not in mammalogy but rather in botany or ornithology, resulted in the major contributions to knowledge of the mammals of Afghanistan prior to 1900. Almost 70 per cent of the species they collected can either be found in the fur bazaars of Afghanistan today or are those species which are easily caught by the Afghans themselves, such as hedgehogs, *Hemiechinus*; pikas, *Ochotona*; mice, *Mus*; and short-tailed mole rats, *Nesokia*.

It was 100 years after the botanist, W. Griffith, made the first collections in Afghanistan that another British subject, J.L. Cha-

worth-Musters, took the first expedition whose primary objective was to collect mammals in that country. This expedition had as a specific goal the collection of additional specimens of the dwarf jerboa, *Salpingotus thomasi*, still known only from the specimen collected by Griffith a century before. A series of mammals was obtained, but no *Salpingotus*. The specimens Chaworth-Musters collected have received at least partial notice by Jordon (1944), Ellerman (1948), and Ellerman and Morrison-Scott (1951). Information in these reports indicates that Chaworth-Musters confined his collecting to the vicinity of Ghazni, Paghman, and the Shibar Pass. This is the first major collection of small mammals from eastern Afghanistan and includes at least 18 species.

Most of the species known to occur in Afghanistan up to 1946 are mentioned as such by Ellerman and Morrison-Scott in their *Checklist of Palearctic and Indian Mammals, 1758 to 1946*. Subsequent to this monumental work, members of the Third Danish Expedition to Central Asia (1948-1949) collected 155 mammals in Afghanistan. Dr. Knud Paludan collected most of these specimens and compiled the unpublished "Notes on Afghanistan Mammals." I have the privilege of publishing on this important collection, housed in the Copenhagen University zoology Museum in Denmark, and on Dr. Paludan's notes, neither having heretofore received detailed recognition in print.

J. Klapperich, collecting near Kandahar, Kabul, and the Salang Pass, obtained 51 small mammals of ten species in 1951 and 1952. These specimens were identified and published by Zimmerman (1955).

A relatively comprehensive collection of mammals was made between 1962 and 1965 by E. Kullman and J. Niethammer, both members of the Faculty of Natural Science at the University of Kabul, as part of a liason between that University and the University of Bonn in Germany. They have made a number of field trips for mammal collecting in various parts of Afghanistan, but most of their work has been confined to areas near Kabul and in Nuristan. Collecting routes beyond the vicinity of Kabul were, with a few exceptions, similar to the ones shown for the present Street Expedition. Kullman and Niethammer have made the most extensive survey of the mammals of Afghanistan to date and their work was published in 1965—the Carnivora, Artiodactyla, and Primates by Kullman; the Insectivora, Lagomorpha, and Rodentia by Niethammer.

In 1966 and 1967, Gaisler et al. (1967, 1968) collected 542 specimens comprising 15 species of Insectivora and Rodentia, 23 specimens belonging to nine species of Carnivora, and one each of two species of Lagomorpha. Systematic collecting and cursory ecological surveys were conducted in the area around Jalalabad, while occasional collections were made in eastern, central, and northeastern Afghanistan. Specimens are deposited in the Institute of Vertebrate Zoology, Czechoslovak Academy of Sciences, in Brno, Czechoslovakia.

ACCOUNTS OF SPECIES

This section treats 84 species of free-living terrestrial mammals which are known to occur or have been reported to occur in Afghanistan, including 20 species for which evidence either is inadequate to map distribution with confidence or suggests they may no longer occur there.

Every account provides the accepted scientific name, together with a citation to the original description of the species and its type locality. Specific names recorded in earlier faunal works dealing with Afghan mammals and which have subsequently been relegated to synonymy are listed as required. Following this standard introduction, each account is composed of two or three of the following major headings: 1) *Distribution*; 2) *Taxonomic Notes and Discussion*; and 3) *Field Notes and Discussion*; or, in lieu of the latter two headings, *Discussion*. The general content of these sections is as follows:

1. *Distribution*

GENERAL: A very approximate geographic range is given for each species. These ranges are, with noted exceptions, based on records in Ellerman and Morrison-Scott's *Checklist of Palaearctic and Indian Mammals* (1951) and on maps by Bobrinskii *et al* (1965).

AFGHANISTAN RECORDS: Not all records are based on collections of specimens; some mammals were seen but not collected, and some published records are imperfectly documented. Where two or more papers refer to the same record, usually only the earliest is cited. Records are arranged chronologically under one of three categories:

A) *Published:* Reference is made to practically every known record published prior to 1970, excepting specimens reported by Hassinger (1968, table 1) which are included under the following grouping.

B) *1965 Street Expedition:* This lists all the records tabulated by Hassinger (*supra cit*), but herein includes Field Museum of Natural History specimen numbers. All numbers not specifi-

cally noted as "in alcohol," "skin only," or "skull only" refer to specimens constituted by skin and skull.

C) *Additional*: This notes the authority for and localities of unpublished records that have been corresponded to me. Also, any Afghan specimen that I have studied but which cannot be included in either of the above categories is here listed by collector, an abbreviation for the name of the museum in which it is preserved, year of collection, and locality.

The abbreviations used are: BM—British Museum (Natural History), London; FMNH—Field Museum of Natural History, Chicago; and CM—Copenhagen University Zoology Museum, Copenhagen.

AFGHANISTAN DISTRIBUTION: With the exception of *Mus musculus*, distribution is mapped for each species. All records prior to 1968 are plotted according to their respective category as open circles, closed circles, and closed triangles. Where there is some doubt as to the provenance of a record a question mark is appended. Plots illustrating 1965 Street Expedition records (closed circles) usually refer to the major localities discussed and illustrated by Hassinger (1968, pp. 57–73, fig. 24) and not to a specific collecting site within the major locality. Numbers affixed to closed circles show the number of specimens collected there. Specific collecting sites of rare or elusive species are further delineated in the text.

Geographic distribution in Afghanistan is estimated and semi-schematically illustrated for each species on the basis of: 1) locality records and available habitat in Afghanistan, and 2) the range of the species in neighboring countries.

Symbols and special notes in legends and captions render maps self-explanatory, thus for each account this subheading simply refers the reader to a map.

AFGHANISTAN HABITAT: Altitudinal range and frequented biotopes are briefly discussed. Vegetation characteristic of observed habitat is described for some species, particularly rodents. When necessary and if possible these data will be supplemented from the literature. Special terms and biotopes are discussed and illustrated by Hassinger (1968, pp. 28–55, figs. 3–20).

2. *Taxonomic Notes and Discussion*

Species attributes which have immediate or potential systematic value and taxonomic problems created or elucidated by observations made during the present study are discussed as appropriate.

Capitalized color terms are from Ridgway (1912). Color descriptions of pelage were based on observations made near a north-facing window between 10:00 A.M. and 3:00 P.M. on non-cloudy days but never in direct sunlight.

Mean and extreme body measurements are presented in tables for "*Published, 1965 Street Expedition*" and "*Additional Records.*" When these records aggregate to fewer than four specimens for a species, dimensions of individuals (if available) are recorded in the text. Combining records from different sources was neither possible nor in some instances advisable, as some authors (c.f. Ellerman, 1948; Niethammer, 1965) provided means and/or extremes but not dimensions of individuals, and others did not specify how measurements were made. Combining such records could skew the results, especially for those species represented by small samples. Tabulated measurements and abbreviations are:

Head and body length (HB)—The greatest length from the tip of the snout to the base of the tail.

Tail length (T)—The greatest length from base to tip without terminal hairs.

Hind foot length (HF)—Greatest length between the posterior-most extension of the calcar (heel) and the tip of the claw on the longest toe.

Ear length (E)—The distance between the most proximal point of the anterior notch and the most distal point of the tip excluding hairs.

All measurements are in millimeters unless otherwise specified. Specimens obtained by the 1965 Street Expedition were measured in the above manner but measurements gleaned from the literature or from tags of additional specimens may have been made differently. For example, Niethammer's (1965) measurements are similar in most respects to those of the Street specimens except the hindfoot was measured to the tip of the longest toe but *excluding the length of the nail*. Special notes are in subscripts under each table.

Fresh, whole animal weights and skull measurements are incorporated into the text as needed. Skull length, as here used, is the least distance on the skull from a line connecting the posteriormost margins of the condyles (or if more posterior, to the most posterior projection of the supraoccipital) to a line connecting the anteriormost projections of the premaxillary bones (or if more anterior, to the tip of the nasals). Skull lengths of shrews were measured from the

anteriormost margins of the upper incisors to the posteriormost margin of the supraoccipital. Other skull measurements are used less; they are described by Cockrum (1957, pp. 33-39).

3. *Field Notes and Discussion*

This section may include interesting notes from published records, natural history observations, collecting techniques, and any other information originating from this study.

Discussion

In the event that collections, literature records, and field observations are insufficient to warrant the use of either of the foregoing two headings (i.e., "*Taxonomic Notes and Discussion*" and "*Field Notes and Discussion*"), then the heading "*Discussion*" will be substituted.

Order INSECTIVORA

Hemiechinus auritus Gmelin Long-eared Hedgehog

Erinaceus auritus Gmelin, 1770, Nov. Comment. Acad. Sci. Petrop., **14**, p. 519.

Type locality.—U.S.S.R., Astrakan Oblast, Astrakhan.

The following species previously recorded from Afghanistan are considered to be subspecies of *Hemiechinus auritus*:

Erinaceus collaris Gray, 1830, in Hardwicke, Illustr. Indian Zool. I, pl. 8.

Doab, between the Rivers Jumna and Ganges, India. (*Hemiechinus auritus collaris*, fide Ellerman and Morrison-Scott, 1951, p. 25.)

Erinaceus albulus Stoliczka, 1872, Jour. Asiat. Soc. Bengal, **41**, 2, p. 226.

Langur, near Sandshu, Yarkand, Chinese Turkestan. (*Hemiechinus auritus albulus*, fide Ellerman and Morrison-Scott, 1951, p. 25.)

Erinaceus megalotis Blyth, 1845, J. Asiat. Soc. Bengal, **14**, p. 353 (footnote)

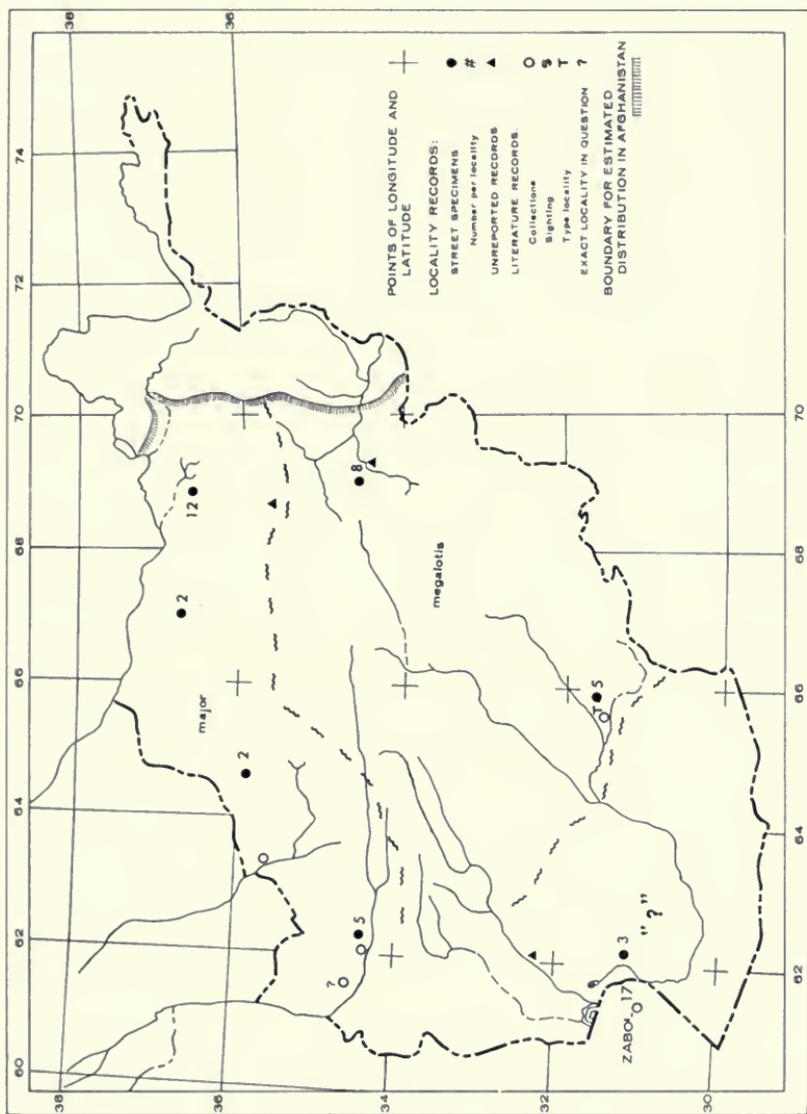
Type locality.—Kandahar, Afghanistan. (*Hemiechinus auritus megalotis*, fide Niethammer (1969) and the present paper.)

Distribution.—

GENERAL: The southwest Palearctic Region from Asia Minor and Libya to western Mongolia and northwest India.

AFGHANISTAN RECORDS: Blyth (1845, p. 353), Horsfield (1851, p. 136), Scully (1881, p. 223; 1887, p. 68), Aitchison (1889, p.

FIG. 1. Distribution of *Hemiechinus auritus* in Afghanistan and a schematic approximation of: a) possible distribution limits (wavy lines) of subspecies *major* and *megalotis* and b) zone of apparent intergradation ("?") between subspecies *persicus* and *megalotis*.



58), Zimmerman (1955, p. 189), Niethammer (1965, p. 19; 1969, pp. 257-274).

1965 Street Expedition: FMNH 102001-102037; in alcohol 102006; skull only 102011, -28, -30.

1939 Chaworth-Musters Expedition (Kabul, B.M. 47.359 and 47.360). Third Danish Expedition, 1948-1949 (Obeh, and near Farah).

AFGHANISTAN HABITAT: Hedgehogs, found from the lowest elevation to 3,000 m. in Afghanistan, were not seen in Wakhan, Badakshan, or in Monsoonal Afghanistan. They were collected in oases as frequently as in the steppes and semi-deserts, evidently frequenting the clay and loess biotope more than any other.

Taxonomic Notes and Discussion.—

Is *Hemiechinus megalotis* a good species or a subspecies of *H. auritus*?

Blyth (1845, p. 353) notes: "the Siberian *E. auritus* is described, in Pennant's Quadrupeds, to have the 'upper jaw long and slender; with very large open ears, naked, brown round the edges, with soft whitish hairs within; tail shorter than that of the European Hedgehog: upper part of the body covered with slender brown spines, encompassed at the base, and near the ends, with a ring of white: the belly and limbs clothed in a most elegant soft white fur.' The statements here italicized do not apply to the great-eared Afghan Hedgehog . . ." According to Ellerman and Morrison-Scott (1951, p. 24): "The British Museum material gives the following cranial measurements for *H. megalotis*, length of skull 52-56.9 mm. (average 54 mm, [sic] two specimens) . . . Our specimens of *megalotis* are from Kandahar and Baluchistan." They contend that *H. auritus* is a smaller hedgehog albeit: "Ognev's form *major* can have the skull as large as in *megalotis*." Siddiqui (1961, p. 94), studying five *megalotis* from Baluchistan, distinguishes *megalotis* as having the longest spine not less than 25 mm. while the longest spine on *H. auritus* was not more than 20 mm. Niethammer (1965, p. 21) mentions that *H. megalotis* ". . . resembles *H. auritus*, but is larger. Its color varies in Afghanistan from nearly white to nearly black." He concludes that: "The measurements of both species will probably prove to overlap when more material becomes available." Niethammer (1969, pp. 257-274), reporting on additional specimens, shows ". . . that if the criteria given in the literature (size, length of spines, number of light and dark bars on the spines, and color of the ventral side) are considered,

TABLE 1.—Measurements of adult *Hemiechinus auritus* subspecies from Afghanistan.

Record	Sample size	Measurements (mean and extremes), in mm.			
		Head and body	Tail	Hind foot	Ear
C.-Musters	2	250 and 255	29 and 30	41 and 40	50 and 48
Zimmerman (1955) ¹	1	195	22	41	48
1965 Street Exp. ¹	8	190-264 (212)	20-36 (26)	41-46 (44)	39-58 (48)
1965 Street Exp. ²	13	164-259 (231)	20-34 (27)	42-49 (45)	42-52 (48)
1965 Street Exp. ³	1	207	29	43	46
3rd Danish Exp. ³	7	156-210 (186)	20-35 (27)	36-40 (38)	41-45 (44)

¹ *Hemiechinus auritus megalotis* collected near Kabul and Kandahar.

² *Hemiechinus auritus major* collected near Kunduz, Mazar-i-Sharif, Mai-mana, and Herat.

³ *Hemiechinus auritus (persicus-megalotis* "intergrades") collected near Farah and Kang is South Afghanistan.

H. megalotis is a subspecies of *H. auritus*." Gropp et al. (1969, p. 302) report identical karyotypes for *auritus* and *megalotis*, concluding they are subspecies of a single species. Lay (1967, p. 119) identified 17 *megalotis* from near Zabol, Iran (about 50 km. west of Kang, Afghanistan) distinguishing them as allopatric from *auritus* and 16 possessing brownish instead of whitish ventral pelage.

I made provisional field identifications using Blyth's and Lay's criteria.

Before me is a sample of skins and skulls of hedgehogs including 22 *H. auritus* (from North, Northwest, and West Afghanistan) and 35 specimens (Baluchistan, 2; Zabol, Iran, 17; and South and Central Afghanistan, 16) provisionally identified as *megalotis*. At the University of Copenhagen Museum I have also examined eight *megalotis* and at the British Museum seven *megalotis* skulls including the lectotype from Kandahar. As shown in Tables 1 and 2 these specimens exhibit a marked variation in size or color or both, within samples from single localities as well as between samples from two or more localities.

Table 2 shows that the mean and extreme skull and spine lengths for *auritus* and alleged *megalotis* are similar. Variation within or between localities is not shown in this table. For example: The mean and extreme skull lengths and fresh weights for the Kunduz, Zabol (Iran), and Paghman samples (sample size is in parentheses) are respectively, 50.2-52.9-55.9 (8), 496 g. (10); 49.4-50.3-52.5 (14), 320 g. (14); and 53.0-55.0-57.3 (6), 806 g. (5), indicating that white bellied hedgehogs (*H. auritus*) from the steppes north of Kunduz are inter-

mediary in size between brownish or greyish bellied hedgehogs (supposed *megalotis*) from Zabol and brown-to-black bellied "*megalotis*" from Paghman. These measurements and weights are of adults with well-worn molars. There is also too much individual variation

TABLE 2.—A comparison of 14 *Hemiechinus auritus* with 29 specimens which were provisionally identified as *H. megalotis*.

Species	(Measurements in mm.)					
	Skull Length		Length of longest spine ¹		Color of ventral pelage ²	
	Mean	Extremes	Mean	Extremes	All White	Not All White
<i>H. auritus</i>	53.0	50.2-55.9	24.7	20.0-31.9	22	0
<i>H. megalotis</i>	54.6	47.7-58.4	24.9	20.7-30.0	3	76

¹ Refers to the length of the longest spine examined by the present investigator. Samples of spines were taken from the rear of the carapace.

² Measurements were taken from 43 adult specimens. However, figures in these columns also include juveniles and 50 unreported individuals from near Zabol, Iran, that were examined and then discarded by Douglas M. Lay (pers. comm).

in the length and color pattern of mid-dorsal spines taken from the front, middle, and rear of 33 skins to permit detection of geographic variation or sympatric species differences in these characters. The size of bullae, length of the maxillary toothrow, greatest width across the upper molars, and the zygomatic and postorbital breadth also show too much variation and overlap. No character of dimension or color could be found consistently to separate *H. auritus* from alleged *H. megalotis*.

On the basis of the foregoing evidence I consider the *H. "megalotis"* collected from Paghman, Kandahar, and Baluchistan to be a large montane subspecies of *H. auritus* having Benzo Brown to black ventral pelage. Measurements of the hedgehogs of medium size with white bellies from the steppes of North, Northwest and northern West Afghanistan are on the average larger but overlap with those of a similarly colored subspecies *H. auritus major* described by Ognev (1928, pp. 135, 136) Ashabad, Transcaspia, Russian Turkestan. The dimensions of smaller hedgehogs from the marshes and semi-deserts surrounding Zabol, Kang, and Farah are similar to those given by Ognev (1928, pp. 139, 140) for *H. auritus persicus* described from Guljander (in Iran, and approximately 250 km. northeast of Zabol), but their [generally non-white] ventral pelage is *megalotis*-like, except

for one specimen from Zabol, and two specimens from Farah which have respectively white and light-greyish venters and are thus perhaps phenotypically indistinguishable from typical *persicus*. As there are no obvious barriers separating the type localities of *persicus* and *megalotis*, the foregoing suggests that the Sistan Basin is a zone of intergradation for these subspecies.

If we correlate the habitat of the aforementioned subspecies with their mean size, we find the largest subspecies was collected within or near the mountains of Afghanistan and Baluchistan, a smaller subspecies(s?) is living on the steppes of North, Northwest, and northern West Afghanistan, but the smallest race(s) is living in the semi-deserts and marshes in the Sistan Basin.

Field Notes and Discussion.—

Three of four adult females collected near Paghman in July contained embryos. One had four embryos, the other two had five. Thirteen hedgehogs collected were crossing roads—two of these were scavenging watermelon rinds lying on the highway. Of two hedgehogs trapped from burrows, one was using a burrow in the middle of a small colony of *Meriones libycus*. This latter specimen is a juvenile.

By October *Hemiechinus* found near Kandahar were hibernating. None were seen on or along roads. Five of these hibernators were collected from deep crevices in the structure biotope, four from the same crevice. One was forced out of an unused irrigation pipe (10 cm. in diameter). Farther south and 500 m. lower, near Kang, hedgehogs were found wandering around on the dry saline mud flats of the Helmand Delta in November.

Paraechinus hypomelas Brandt

Brandt's Hedgehog

Erinaceus hypomelas Brandt, 1836, Bull. Sci. St. Petersburg, 1, p. 32.

Type locality.—Northern Persia.

Erinaceus macracanthus Blanford, 1875, Ann. Mag. Nat. Hist., 16, p. 310.

Near Kerman (Carmania), 5,000–6,000 ft. (1,524–1,829 m.), Persia.

Paraechinus amir, 1918, Thomas, Ann. Mag. Nat. Hist., I, p. 232. Kandahar, Afghanistan.

Distribution.—

GENERAL: From West Pakistan to Arabia and north across the Iranian Plateau as far as Samarkand Prov. in Uzbekistan, S.S.R. and Ust-Urt in Turkmeniya, S.S.R.

AFGHANISTAN RECORDS: Scully (1881, p. 224); Murray (1887, p. 118) lists *E. macracanthus* from: "Zandra, S. Afghanistan."

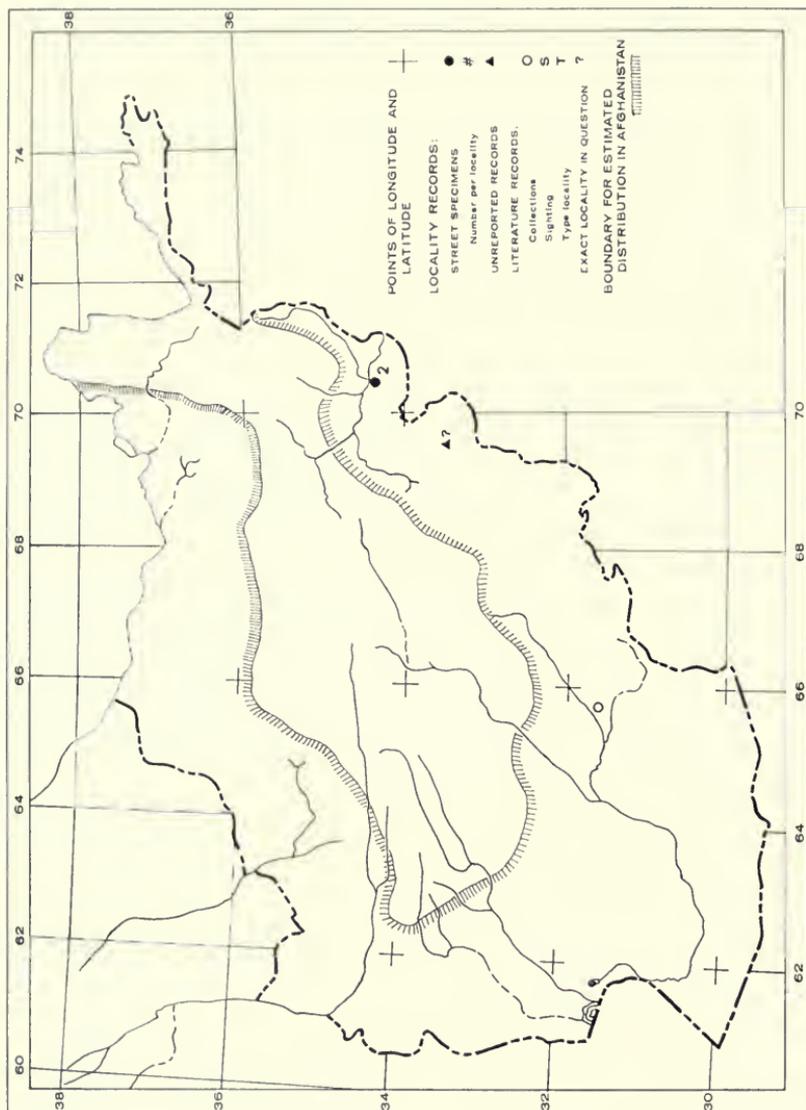


FIG. 2. Distribution of *Paracichnus hypomelas* in Afghanistan.

This locality is east of Quetta, W. Pakistan. Murray (1887, pp. 49-68, 105-131) lists many locality records of various mammal species for southern Afghanistan, which today are within the confines of Baluchistan.

1965 Street Expedition: FMNH 102038, -039.

Niethammer (1967, *in litt.*; Paktia).

AFGHANISTAN HABITAT: The Street Expedition collected this species from the Jalalabad Vale. One was taken from a shallow cave with many bats (*Rhinopoma microphyllum*), a second from the roadside between Jalalabad and the Khyber Pass; both from below 1,000 m. in the clay and loess biotope.

Discussion.—

The specimen that Scully (1881, p. 224) refers to *E. macracanthus* was collected at Kandahar by C. Swinhoe. Thomas (1918, p. 232) re-describes this same specimen as *P. amir*.

Compared with *Hemiechinus auritus*, *Paraechinus* is a darker hedgehog, appearing black rather than grey when viewed from above, but, the most distinguishing character is the medial parting of the spines on the crown leaving a narrow nude space there. Neither hair nor spines are found in this space.

The two specimens collected by the Street Expedition were young males measuring: HB, 218, 216; T, 22, 33; HF, 38, 40; and E, 42, 41.

One specimen found in a shallow cave on August 3 was lethargic but not hibernating; the second was captured October 22 while crossing a paved road east of Jalalabad. These were the only hedgehogs seen in the Jalalabad Vale.

The genus *Hemiechinus* was conspicuously absent in the Jalalabad Vale or, compared with localities where *Hemiechinus* was collected or observed, the population must have been extremely sparse. By contrast, the population density of *Paraechinus* must have been high. Niethammer (1967, *in litt.*), collecting throughout Afghanistan, found one specimen. Lay (1967, p. 121) collected remains of a specimen of *Paraechinus* in Iran while seeing over 60 hedgehogs of the genera *Hemiechinus* and *Erinaceus*. Hedgehogs were usually collected by hunting and usually before midnight, but were also purchased from villagers.

Crocidura suaveolens Pallas

Lesser Bicolored
White-toothed Shrew

Sorex suaveolens Pallas, 1811, Zoogr. Ross. As., 1, p. 133, pl. 9, fig. 2.

Type locality.—Ukrainian S.S.R.: Crimea; Khersones.

Distribution.—

GENERAL: Its principal distribution forms a belt between latitudes 30° and 55°N across the entire Palearctic Faunal Region, so that it seems to be found from Germany and Morocco east through the deserts of Central Asia to Korea. It is conspicuously absent from all but the northeasternmost parts of the Oriental Faunal Region. In Iran, it was collected on the northern slopes of the eastern Elburz Mountains and on the Turkmen Plains (Lay, 1967, p. 128).

AFGHANISTAN RECORDS: 1965 Street Expedition: FMNH 102040-66; in alcohol 102041, -52, -53, -54, -56, -58; skin only 102061.

AFGHANISTAN HABITAT: Collected in the clay-and-loess, rock, and structure biotopes between 500 and 2,500 m. in North, Northwest, and West Afghanistan. Its microhabitat is characterized by vegetation having medium to high density, medium shade, one, two or three strata, irregular distribution and medium to high homogeneity.

Taxonomic Notes and Discussion.—

The mean and extreme dimensions of 18 skulls of individuals considered adult are: greatest length, 17.4–19.0 (18.3); cranial breadth, 7.9–8.5 (8.2); width between infraorbital foramina, 3.2–3.6 (3.4); and greatest antorbital width, 5.3–6.1 (5.7).

The color of the dorsal pelage ranges from Drab-Gray in juveniles to Drab in adults.

This shrew resembles the subspecies *C. suaveolens iliensis* Miller as described by Ognev (1928, pp. 360–366). Its short tail distinguishes it from other species of shrews found in Afghanistan. Body measurements are compared with those of other species of *Crocidura* in Table 3.

Field Notes and Discussion.—

Many Street Expedition specimens were collected in oases. An apparently dense population was discovered on an Afghan government experimental farm west of Mazar-i-Sharif. Traps placed along shallow irrigation ditches supplying a fallow terrace with water assured us a good sample of this population. Three lactating females were collected here on August 30. On September 6 a nest containing

TABLE 3.—Body dimensions of *Crocidura* and *Suncus* from Afghanistan, Iran, and West Pakistan.

Species	Records	Sample	(Measurements in mm.)				
			Head and body	Tail	Hind foot	Ear	
<i>C. russula</i>	Niethammer (1965)	10	60-73	38-46	12-13		
	1965 Street Exp.	66	61-80(69.2)	32-45(40.6)	12-14(13.7)	7-10(8.5)	
<i>C. suaveolens</i>	1965 Street Exp.	27	52-72(63.0)	29-39(35.0)	11-14(12.6)	7-9(8.4)	
<i>C. zardnyi</i>	Ognev (1928, p. 341) ¹	1	60.8	47.5	13	8	
	BMNH collection ²	4	53-60(55.2)	39-53(44.5)	12-13(12.3)	9-10(9.8)	
	Lay (1967, p. 129)	6	56-66(60.0)	40-48(44.2)	11-14(12.6)	8-10(9.2)	
<i>C. z. streptorum</i>	1965 Street Exp.	4	58-71(63.3)	43-50(45.7)	12-12(12.0)	8-10(9.0)	
<i>S. murinus</i>	Niethammer (1965)	1	120	78	20	11	
	1965 Street Exp.	6	103-137(123)	63-68(64)	19-21(20)	11-13(12)	

¹ The type.

² Ellerman and Morrison-Scott (1951, pp. 72, 83) studied three of these specimens and concluded that they represented a subspecies of *C. pergrisea*, thus *C. pergrisea zardnyi*.

three juveniles, two males and a female, was found here under a small pile of weeds surrounded by a thick stand of grass. These juveniles had lighter colored pelage than adults taken nearby. For each of 14 shrews we caught two house mice.

Crocidura russula Hermann

(Common European)

White-toothed Shrew

Sorex russulus Hermann, 1780, in Zimmerman, Geogr. Gesch., 2, p. 382.

Type locality.—Eastern France, Bas-Rhin near Strasbourg.

Distribution.—

GENERAL: This species is widely distributed in the temperate and subtropical zone from Spain and Algeria to Japan and Korea.

AFGHANISTAN RECORDS: Niethammer (1965, p. 22).

1939 Chaworth-Musters Expedition (Paghman, Shibar Pass).

1965 Street Expedition: FMNH 102067-122, 102124-133; in alcohol 102082, -085, -088, -090, -118, -119, -121, -133; skull only 102095.

Third Danish Expedition, 1948-1949 (Kabul).

AFGHANISTAN HABITAT: This shrew was collected between 1,000 and 3,000 m. in montane Afghanistan; the largest number being taken in the watercourse and structure biotopes.

Taxonomic Notes and Discussion.—

The mean and extreme dimensions of 39 skulls are: *greatest length of skull*, 18.2-20.0 (19.1); *condylo-premaxillary length*, 16.6-18.5 (17.6); *cranial width*, 8.3-9.3 (8.7); *width between infraorbital foramina*, 3.2-3.8 (3.5); and *greatest antorbital width*, 5.5-6.4 (6.0). Comparing these figures with similar measurements (c.f. page 23) for *C. zarudnyi* shows *russula* skulls to be larger, especially in the two characters herein italicized. As noted by Ellerman and Morrison-Scott (1951, p. 72), *russula* does not have the tail as much as 70 per cent of the head and body, which is, however, a characteristic of *C. zarudnyi*.

The general color of the dorsal pelage ranges from Hair Brown to Chaetura Drab gradually changing to Drab-Gray ventrally.

Comparison of *C. russula* with *C. zarudnyi streetorum* from the same locality shows the *C. russula* to be perceptibly darker; their backs appearing dark grayish-brown and not, as described for *C. Z. streetorum*, grizzled brownish-gray.

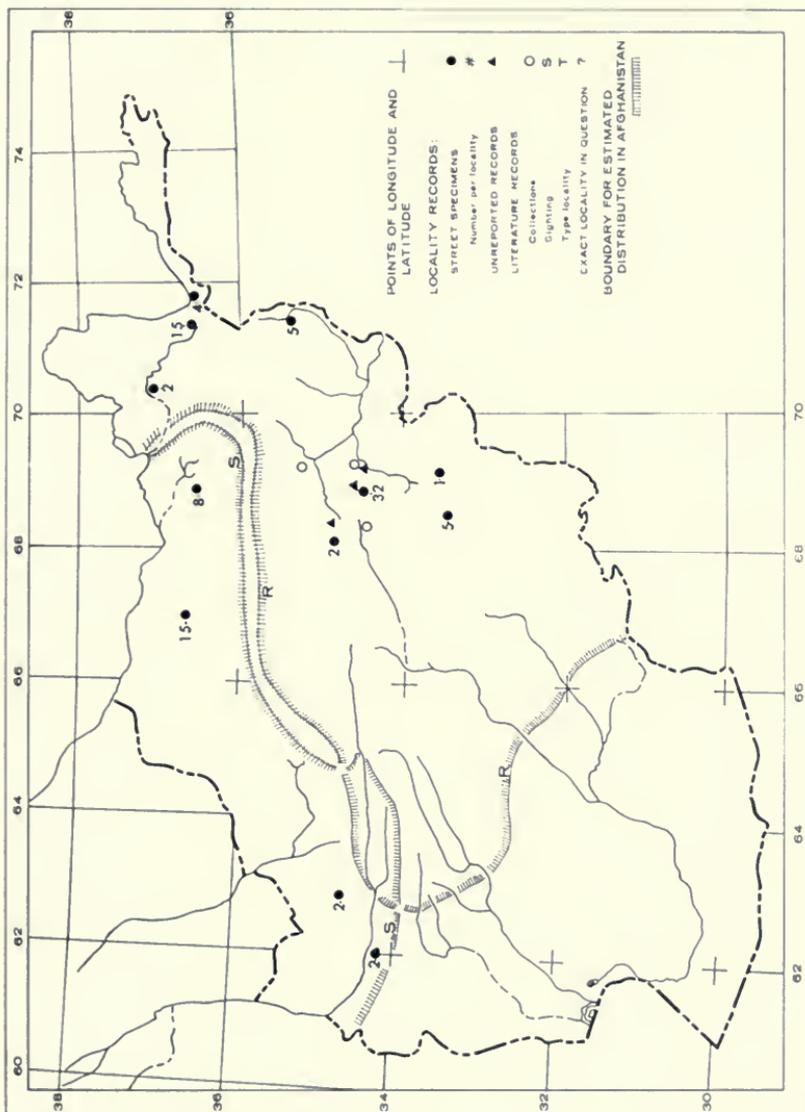


FIG. 3. The records and estimated limits of distribution for *Crocidura russula* (R) and *Crocidura suaveolens* (S).

Field Notes and Discussion.—

Sixty-one of the 66 *Crocidura russula* trapped were taken from rocky terrain. All 66 came from places with free water accessible in the form of a nearby stream or irrigation ditch, but the kind of vegetation had no apparent effect on their local or geographic distribution. They were trapped in evergreen oak and coniferous forests in Nuristan, along alfalfa fields and in willow thickets in northeast Afghanistan, under mulberry trees in the Paghman oasis, and along irrigation ditches lined with camel thorn near Ghazni. They were consistently captured in sites with vegetation having a low homogeneity. Traps set in this typical habitat near Jalalabad and Kandahar, however, failed to yield any shrews.

Sixty-four shrews were trapped in museum special snap traps baited with small amounts of our usual (stock) bait, a mixture of peanut butter, oatmeal, and raisins. A single shrew was captured in a trap baited with the liver of a migratory hamster. This was an unsatisfactory bait because in dry Afghanistan meat desiccates rapidly, and no shrews were captured with dry meat.

***Crocidura zarudnyi* Ognev** East Persian White-toothed Shrew

Crocidura zarudnyi Ognev, 1928, Mamm. E. Europe, N. Asia, I, p. 341. New name for *tatianae* Ognev, 1921, *nec* Dollman, 1915.

Type locality.—East Persia near the Baluchistan border.

Distribution.—

GENERAL: *C. zarudnyi* has been collected from the Sistan Basin in Iran (Lay, 1967, p. 129, as *pergrisea*), Baluchistan (Siddiqi, 1961) and in Lyallpur, W. Pakistan (Taber, 1967, p. 369), and now in Afghanistan.

AFGHANISTAN RECORDS: Hassinger (1970, pp. 5–8).

1965 Street Expedition: FMNH 102123, -34, -35, -36.

AFGHANISTAN HABITAT: Ranging from 200 to 3,000 m. in the rock, and structure/clay-and-loess biotopes. This species was, without exception, found in dryer situations in Afghanistan, Iran (Lay, 1967, p. 129), and in W. Pakistan (Taber, 1967, p. 395) than was *C. russula* or *C. suaveolens*.

Taxonomic Notes and Discussion.—

Ellerman (1951, pp. 72, 83) includes *C. zarudnyi* as a subspecies of *C. pergrisea* saying: "we have not seen *pergrisea*, but from descriptions it is very like the Baluchistan form, *zarudnyi*, which it ante-

dates." At this writing I have before me both paratypical specimens of *C. pergrisea*, the three specimens of the *C. zarudnyi* placed in synonymy by Ellerman, a specimen from Lyallpur, W. Pakistan, six *C. zarudnyi* (*pergrisea*) collected by the earlier Street Expedition (Lay, 1967) from the Sistan Basin, and our four from montane habitat in Afghanistan.

A number of measurable differences are observed between the samples of *Crociodura zarudnyi* and *C. pergrisea* as follows:

In total length (whether obtained as tip of snout to tip of tail excluding hair, or as head-and-body length plus tail length) means and extremes (in millimeters) of 14 *zarudnyi* are 103.9 (96–116) compared to the 125, 128, and 129 of three *pergrisea*.

In greatest length of skull 11 *zarudnyi* are 18.1 (16.9–19.0) compared to 20.0 and 20.1 of two *pergrisea*.

In greatest condylo-premaxillary length of skull 12 *zarudnyi* are (16.5–18.2) compared to 19.0, 19.1, and 19.3 of three *pergrisea*.

In greatest cranial breadth 12 *zarudnyi* are 7.9 (7.5–8.3) compared to 8.7, 8.8, and 8.9 for three *pergrisea*.

The length of the longest mystacial in 12 *zarudnyi* is 22 mm.; whereas that in two *pergrisea* is 27. The longest dorsal hairs in 12 *zarudnyi* are 6 mm., but in two *pergrisea* are 8 mm.

The base of the dorsal hair of *C. pergrisea* (collected in October) from near Shigar, Baltistan, Kashmir, 2,900 m., is Dark Mouse Gray followed by a 1 mm. band of white and tips varying from Cinnamon Drab to Hair Brown, giving their pelage an *extremely pilose, grizzled, pale grayish-brown* appearance. The base of the dorsal hair of *C. zarudnyi* (collected in November) from Iran, montane Baluchistan and Lyallpur, 100–2,400 m., is Deep Mouse Gray (lighter than Dark Mouse Gray) followed by a narrow 0.5 mm. band of white and tips of Cinnamon Drab, giving their pelage a slightly grizzled, dull cinnamon-brown (Cinnamon Drab) appearance. Four *C. zarudnyi* (collected in July, August, and October) from mountains in Afghanistan, 2,250–2,650 m., have dorsal hairs similar to those of *pergrisea* but shorter and without Cinnamon Drab tips, giving their dorsal pelage a much less pilose, less grizzled, brownish-gray appearance.

Thus, the very small sample of *Crociodura pergrisea* seems to be of a substantially larger form than *zarudnyi*, and one that differs markedly from *C. zarudnyi* in October pelage. These differences

seem to me to be great enough to justify recording them here as separate species.

I have not seen the habitat of *C. pergrisea*, but the site of its collection, in glacier-scarred, rocky mountains of Baltistan, has a mean elevation of approximately 3,000 m. and must be quite unlike the low (200 m.) saline semi-deserts of the Sistan Basin wherein we obtained these possible topotypes of *Crocidura zarudnyi*. The montane specimens of *C. zarudnyi* from Afghanistan were each collected from topography surely more similar to that of Baltistan for being between 2,300 and 2,700 m. elevation: one was collected at the entrance to the Wakhan Corridor, about 400 km. northwest of the type locality (Skoro Loomba, Shigar, Baltistan) of *C. pergrisea*. However, this more "topographically related" form of *C. zarudnyi* is almost as different from *C. pergrisea* as its low desert counterpart.

So far I have been concerned to distinguish the several samples of *C. zarudnyi* from a single sample of *C. pergrisea* and have collectively referred to the four specimens from Afghanistan as a montane sample of *C. zarudnyi*. The measurements of these four specimens overlap those of typical *C. zarudnyi* from Iran and southern West Pakistan in every character, however, as described above, their average and extreme total length is greater, and their dorsal color is brownish-gray and not, as shown for other *zarudnyi*, dull cinnamon-brown. Judgment concerning size differences between lowland and montane *zarudnyi* cannot be conclusive until additional specimens become available, but the color difference is so pronounced and so consistent for the four localities (Ishkamish, Badakhshan; Shibar Pass, Central natural area; and Ghazni and Gardez of the Eastern natural area), that subspecific recognition must be considered.

The montane sample of *zarudnyi* was only collected in the rock biotope, but lowland specimens reported from the Sistan Basin (Lay, 1967, p. 129) were taken in the structure and clay-loess biotopes, and from Lyallpur, W. Pakistan (Taber, 1967, p. 395) on a ". . . xeric tropical thorn plain." The Afghan sample ranges, as illustrated in Figure 4, from 33°37'N to 36°43'N, and of the other samples the northernmost is (Lyallpur) 31°25'N. Besides biotope and latitude the Afghan samples are separated from the more southern samples by altitude, the lowest Afghan one being 2,250 m. and the highest and lowest others being Kelat and Turbat (Ellerman and Morrison-Scott, 1951, p. 83) approximately 2,000 and 100 m.

In summary, I find the size, color, and distribution of the four Afghan specimens to be unlike that of any other shrew population

presently known from the Iranian Plateau or West Pakistan. This difference is the basis for description of a new subspecies:

***Crocidura zarudnyi streetorum* new subspecies.**

Type.—FMNH No. 102123, adult female from Afghanistan: 30 km. northwest of Ghazni, approximately 33°43'N 68°15'E; collected October 8, 1965 by Jerry Hassinger, from dry, rocky habitat described in Hassinger (1968, fig. 8).

Description.—The type and three paratypes (FMNH 102134–102136) consist of skins and skulls. The body measurements for the type are HB, 58; T, 45; HF, 12; E-8. Its skull measures: greatest length, 18.3; condylo-premaxillary length, 17.5; cranial width, 8.0. The dorsal pelage is slightly grizzled, brownish-gray gradually changing low on the sides to white or Pale Smoke Gray ventral pelage consisting of hairs with Dark Mouse Gray bases tipped with white. Tail is Pale Smoke Gray, the proximal third being almost unicolor, the distal two-thirds having a dorsal stripe of hairs resembling the dorsal pelage. The feet are Light Buff to white.

Diagnosis.—Differs from the typical form in the following: 1) grayer color; 2) greater total length. The general hue of the dorsal pelage for typical *zarudnyi* and *C. z. streetorum* is, respectively: dull cinnamon-brown, and brownish-gray. The average total length for 12 *C. z. zarudnyi* and four *streeorum* is respectively: 102 mm. and 109 mm.

Material examined.—*Crocidura pergrisea*, 2—USNM 175917, 175919; Kashmir: Skoro Loomba; Shigar, Baltistan. *Crocidura zarudnyi zarudnyi*, 10—BM 19.11.7.15, 19.11.7.16, 19.11.83, 64.1195; West Pakistan: Panjgur, Turbat, Kelat, and Lyallpur, respectively. FMNH 96403 and 96409–13; Iran: Kerman (Seistan): 24 km. south-west of Zabol. *Crocidura z. streetorum*, 4—FMNH 102123 and 102134–36; Afghanistan: see Figure 4 for localities.

The author considers it a privilege to name this subspecies in honor of William S. and Janice K. Street.

More specimens of the above forms would permit a more precise evaluation of their relationships. Series of specimens from the Pamirs, Kashmir, Tibet, and the Himalayas would be material for a significant contribution to the taxonomy of these species.

Field Notes and Discussion.—

Niethammer (1965, p. 22) identified parts of shrew skulls, found in pellets of *Asio otus* from Kang in Sistan, as *C. russula*. Dr.

Niethammer kindly sent me his most nearly complete skull from this locality. It is virtually identical to skulls of *zarudnyi* collected near Zabol, Iran (about 50 km. west of Kang); its greatest length and cranial width being 18.2 and 7.9, respectively. (See *C. russula*, p. 20, for characters distinguishing these species.)

C. zarudnyi streetorum is widely distributed, however, we never succeeded in catching more than a single specimen in any specific locality. This shrew was found in the habitat of the mouse-like hamster, *Calomyscus bailwardi*, and taken in traps set specifically for *C. bailwardi*, excepting for the one specimen from the Wakhan, which was caught in talus about 50 m. from a heavily vegetated gully having a large population of *Alticola roylei*.

Suncus murinus Linnaeus

House Shrew

Sorex murinus Linnaeus, 1766, Syst. Nat., 12th ed., I, p. 74.

Type locality.—Java.

Distribution.—

GENERAL: Southern Asia from southeastern China to Egypt. The range of this species has been modified by commensalism with man. It has at least a sporadic distribution throughout the Oriental Region reaching north of it to Japan, and it is also found in some southwest Asian Palearctic countries and some northeastern countries of the Ethiopian Region.

AFGHANISTAN RECORDS: Horsfield (1851, p. 134), Niethammer (1965, p. 22), Gaisler et. al. (1967, p. 358).

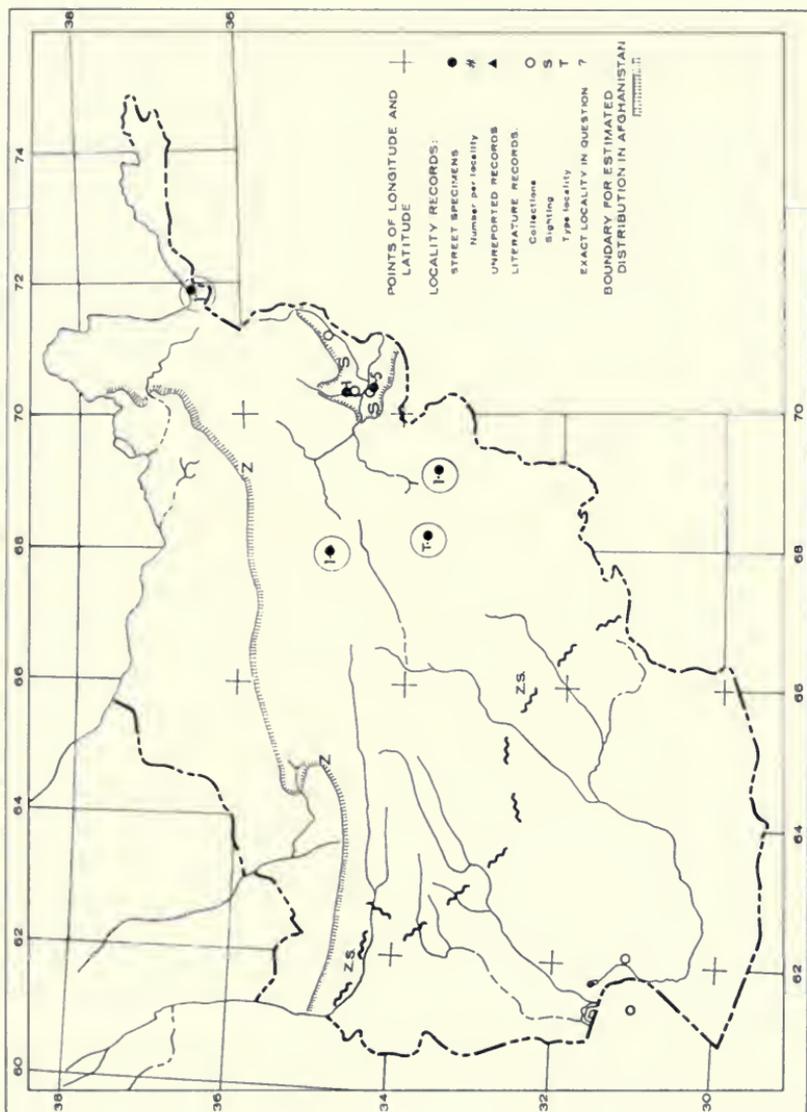
1965 Street Expedition: FMNH 103137-42.

AFGHANISTAN HABITAT: The house shrew was collected in the Jalalabad Vale and Chagha Sarai. It was taken between 700 and 900 m. in the structure and watercourse/rock biotopes.

Taxonomic Notes and Discussion.—

Suncus murinus griffithi was collected by William Griffith and described as *Sorex griffithi*, from Afghanistan, by Horsfield (1851, p. 134). Blyth (1856) states: "We suspect that *S. griffithi* Horsfield, of that naturalist's Catalogue of the specimens of Mammalia in the Honourable Company's Museum is no other than our presumed

FIG. 4. The records and estimated limits of distribution for *Suncus murinus* (S) and *Crocidura zarudnyi* (Z). Records for *C. zarudnyi streetorum* are circled and a zone of possible intergradation (wavy lines) between this subspecies (z.s.) and other *zarudnyi* is hypothesized.



Murinus from the Arakan and Khasya Hills, although described from Afghanistan, because we saw a fine skin from Cherra Punji in the possession of the late Mr. Griffith, which was forwarded to the India House by Mr. M'Clelland; and we have previously had occasion to remark; that specimens of reptiles procured by Mr. Griffith in Afghanistan and in the Khasya Hills, had manifestly become mixed and confounded; whence certain important mistakes concerning habitats." Cherra Punji is in Assam, about 42 air kilometers N.N.W. of Sylket. Ellerman and Morrison-Scott (1951, p. 7) commenting on the type for *Suncus murinus griffithi*, states the label of the type has "Afghanistan," but this has been crossed out and "Silket" substituted. They refer the reader to Lindsay (1929, p. 333). Lindsay, in reference to the above comments by Blyth remarks: ". . . Blyth's explanation seems so reasonable that this shrew had been inadvertently entered as from Afghanistan, rather than Assam, and since he himself saw a specimen in the possession of Dr. Griffith, which undoubtedly came from Cherrapunji, Assam, it is safe to assume that Blyth is right and so *griffithi* denotes the Hill species of Assam."

I have examined the type of *Suncus murinus griffithi* (B.M.79.11.-21.471) and 20 specimens from the Arakan and Khasya Hills, five of which are from Cherrapunji, the proposed type locality for *griffithi*. My observations support those of Blyth (1856) and Lindsay (1929), in that the specimens from the Hills of Assam resemble the type specimen of *griffithi*, while our specimens from Afghanistan have lighter colored (Drab to Hair Brown) dorsal pelage and are smaller than *griffithi*. The greatest skull length for the type and two adults from Cherrapunji is over 34.0 mm. while the longest of six skulls from Afghanistan is 32.2 mm.

If Cherrapunji is indeed the type locality for *griffithi*, we are left with the question: Is *Suncus murinus griffithi* a junior synonym of *Suncus murinus soccatus*? Ellerman and Morrison-Scott (1951, p. 66) following Lindsay (1929, p. 333) includes *Sorex heterodon* Blyth (1855, J. Asiat. Soc. Bengal, **24**, p. 31) as a synonym of *Suncus murinus soccatus* Hodgson (1845, Ann. Mag. Nat. Hist., **15**, p. 270). The type locality for *Sorex heterodon* is Cherrapunji, in the Khasi Hills, Assam. Thus, if *heterodon* and *griffithi* are so similar as well as geographically close, and *heterodon* is a synonym of *soccatus*, then for the hill of subspecies of Assam the name *griffithi* is also a junior synonym of *soccatus* from the Central Region of Nepal. This in-

quiry reaches a little beyond the projected scope of this paper, but a cursory comparison of 10 *soccatus* from the vicinity of Darjeeling with the aforementioned specimens from Cherrapunji did not reveal any characters which would consistently separate these two named forms.

Field Notes and Discussion.—

In the Jalalabad bazaar three house shrews were procured by providing the owners of various stores with traps. We trapped a single specimen from one of a series of burrows in the weedy garden of a hotel. The other burrows there yielded three *Nesokia indica*. Two shrews were collected west of Jalalabad: one from Laghman and the other in a small seepage covered with rocks and dense vegetation, draining a steep slope about 11 km. west of Jalalabad. This is the first collection of this synanthrope from other than the structure biotope in Afghanistan.

These shrews were trapped using museum specials baited with peanut butter, oatmeal, and raisins.

Order PRIMATES

Macaca mulatta Zimmerman

Rhesus Macaque

Cercopithecus mulatta Zimmerman, 1780, Geogr. Gesch. Mensch., 2, p. 195.

Type locality.—"India."

Distribution.—

GENERAL: This sub-tropical, short-tailed macaque has its centers of distribution between 25 and 30° north latitude ranging from eastern China through northern Vietnam, Burma, and India, and along the southern flanks of the Himalayas to Monsoonal Afghanistan. The most north-western record of this macaque is Nuristan in Afghanistan.

AFGHANISTAN RECORDS: Babur in the sixteenth century A. D. (1921, p. 213); Kullman (1965, pp. 15, 16).

1965 Street Expedition: FMNH 102839.

AFGHANISTAN HABITAT: This species has a disjunct distribution in Afghanistan. Kullman (1965) states: "Monkeys live in large numbers in the forests of Nuristan and Paktia." The Street Expedition obtained its single specimen by purchase alive in Kandahar, but it was said to have been captured north of Chagha Sarai.

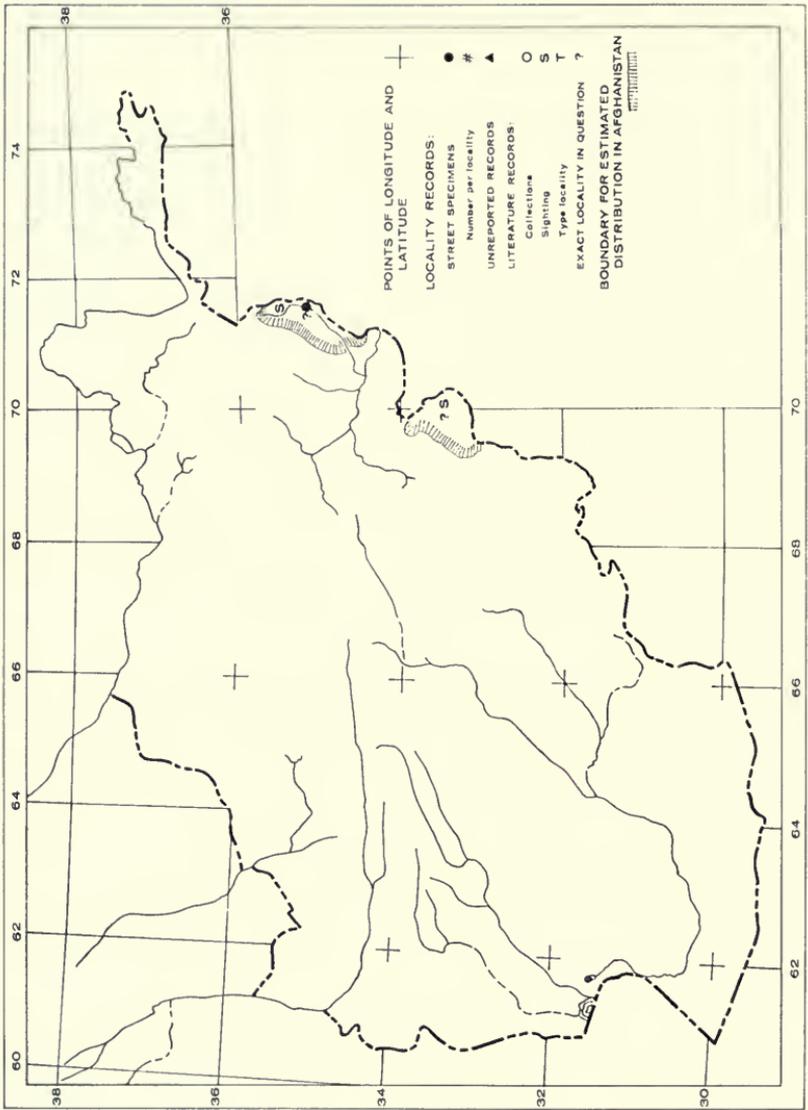


FIG. 5. Distribution of *Macaca mulatta* in (Monsoonal) Afghanistan.

Discussion.—

The specimen, a young female, had been captured as an infant and maintained in captivity for 15 months.

I could find no measurements of Afghan macaques in the literature, therefore the following skin and skull measurements are included: HB, 355; T, 182; HF, 123; E, 42; width of braincase—61.1; zygomatic width—63.7; greatest length—84.6; distance from a line connecting the anterior alveolar edge of the upper incisors to the most posterior margin of the nasals—28.1; skull length from the posterior margin of the nasals to the most posterior bulge of the braincase—80.0. By its dentition (all deciduous still, except for the permanent first molars, of course) Dr. Jack Fooden, Research Associate, Field Museum, places its age at two years and advises that adulthood is attained at about five years.

A specimen which became the type of a subspecies, *Macaca mulatta mcmahoni* Pocock (1932), was collected at Kootai in lower Chitral, W. Pakistan, between the Bashgul Valley in Kafiristan (=Nursitan) and the Chitral Valley at 3,600 ft.

I can find no reference to an actual collection of this species from Afghanistan, although different authors state monkeys can be found, or were seen in Monsoonal Afghanistan. Kullman (1965, pp. 15, 16) gives no specific locality for any observation of a wild one. I was privileged to visit the Zoological Garden in Kabul, where Dr. Kullman had three rhesus macaques in captivity, not unlike the specimen we purchased.

I saw other live monkeys, all captives performing for monkey trainers, three in Kabul, one in Jalalabad, and three in Kandahar. When questioned, the trainers without exception said the monkeys came from either Nuristan or Paktia.

Kullman (1965, p. 16) mentions that a long-tailed monkey was described to him in Mangall, Paktia. He speculates that it might be the langur, *Presbytis entellus*, which is distributed over India and Kashmir. Pocock (1939, p. 51) also speculates on a description (by Raverty, 1859, p. 332) of a large monkey found in the densely wooded district of warmer Kafiristan, concluding it might possibly be the langur.

Order LAGOMORPHA

Ochotona macrotis Gunther

Large-eared Pika

Lagomys macrotis Gunther, 1875, Ann. Mag. Nat. Hist., 16, p. 231 (September).

Type locality.—Doba, Kuenlum Mountains, extreme southern Chinese Turkestan.

Distribution.—

GENERAL: The Tianshan and Pamir mountains in Russia, and the mountains of southern Sinkiang, China, south to northern Nepal, Kashmir, and Nuristan.

AFGHANISTAN RECORDS: Popov (1962, pp. 107–109).

Third Danish Expedition, 1948–1949 (Stiewe, Nuristan), Niethammer (1966, in litt., Wakhan Region).

According to Povolny and Daniel (1966, pp. 371, 373) the valley of Chap Darrah (3,700 m.) in the Wakhan Region: “. . . was frequently visited by pikas (*Ochotona rufescens* Gray) leaving there numerous traces of their activities.” Subsequently, and without explanation, they introduce a second species (*O. roylei*) from the Wakhan Region (the valley of Ishmurkh Darrah, 4,000 m.). This listing is immediately followed by a reference to: “. . . 11 pikas, which were trapped in the valley of Chap Darrah . . .” These locality records would (for both *roylei* and *rufescens*) represent range extensions into the known range of *O. macrotis*. It is possible that the Wakhan Region is a meeting ground for *roylei* from the southeast and *macrotis* from the north and northeast but collection of 11 *rufescens* ranging in from the south and west seems unlikely (see *Ochotona* distribution map). Since those authors present no evidence to support their identifications (and because they were less concerned with pikas for themselves as potential hosts of parasitic Diptera), their collections alleged to be *roylei* and *rufescens* are herein regarded as probably *macrotis*, but not included on the distribution map for *Ochotona*.

AFGHANISTAN HABITAT: Montane biotopes between 2,000 and 4,000 m. According to Scully (1881, p. 207), this species frequents open stony ground near the snowline.

Discussion.—

On the average the three *O. macrotis* from Stiewe (collected April 20, 1948) appear to be smaller than adult *O. rufescens*, but with larger ears and different pelage. Ellerman and Morrison-Scott (1951, p. 448) distinguish *macrotis* as having larger ears (rarely less than 27 mm.) than *rufescens* (rarely reaching 27 mm. in length). The overall tone of the dorsum of the feet of *macrotis* is Pale Cinnamon Pink,

TABLE 4.—Body measurements of *Ochotona* from Afghanistan.

(Measurements in mm.)

Species	Record	Sample	Head and body	Hind foot	Ear
<i>O. macrotis</i>	3rd Danish Exp.	3	172,167,160	30,32,30	24,28,25
<i>O. rufescens</i>	Niethammer (1965) ²	10	160-209	31-36	21-28
<i>O. rufescens</i>	1965 Street Exp. ³	16	180-229(200)	34-39(37)	22-28(25)

¹ Measurements recorded in the field; the remaining figures for this record are of dried skins.

² Extremes only.

³ All adults.

and the length and breadth of the ears of three dried specimens averages 26 by 26 mm., in contrast with Pinkish to Cinnamon-Buff feet and 18 by 18 mm. ears of ten dried, adult specimens of *O. rufescens*.

A male and two females collected (June 20, 1948) in the valley between Stiewe and Weran Pass (3,350 m.) represent the south-western-most record of this species. One of these females had five embryos; the other was lactating. Paludan (Third Danish Expedition field notes) lists sightings of pikas in the Weran Valley (3,720 m.) and between Tilli (2,675 m.) and Nau. He notes: "They stopped at about 3,900 m., perhaps 4,000 m. They are as a rule found where the boulders are adjacent to small, grassy areas."

Popov (1962) reports this species from the mountains of Badakhshan. Niethammer's collection of *macrotis* in the Wakhan is not unexpected, as they are found immediately to the north (see Bobrinski et al., 1965) and south.

Ochotona rufescens has not been collected east of 69°30'E longitude; in contrast, *O. macrotis* has not been found west of Nuristan or Badakhshan. The ranges of these species probably meet in the vicinity of west Nuristan. If their ranges overlap, *macrotis* will most likely be found at higher elevations.

Ochotona rufescens rufescens Gray

Afghan Pika

Lagomys rufescens Gray, 1842, Ann. Mag. Nat. Hist., 10, p. 266.

Type locality.—Near Babers Tomb, Kabul, Afghanistan.

Distribution.—

GENERAL: From the Kopet-Dag Mountains in Iran through south-western Russian Turkestan to Afghanistan and Baluchistan.

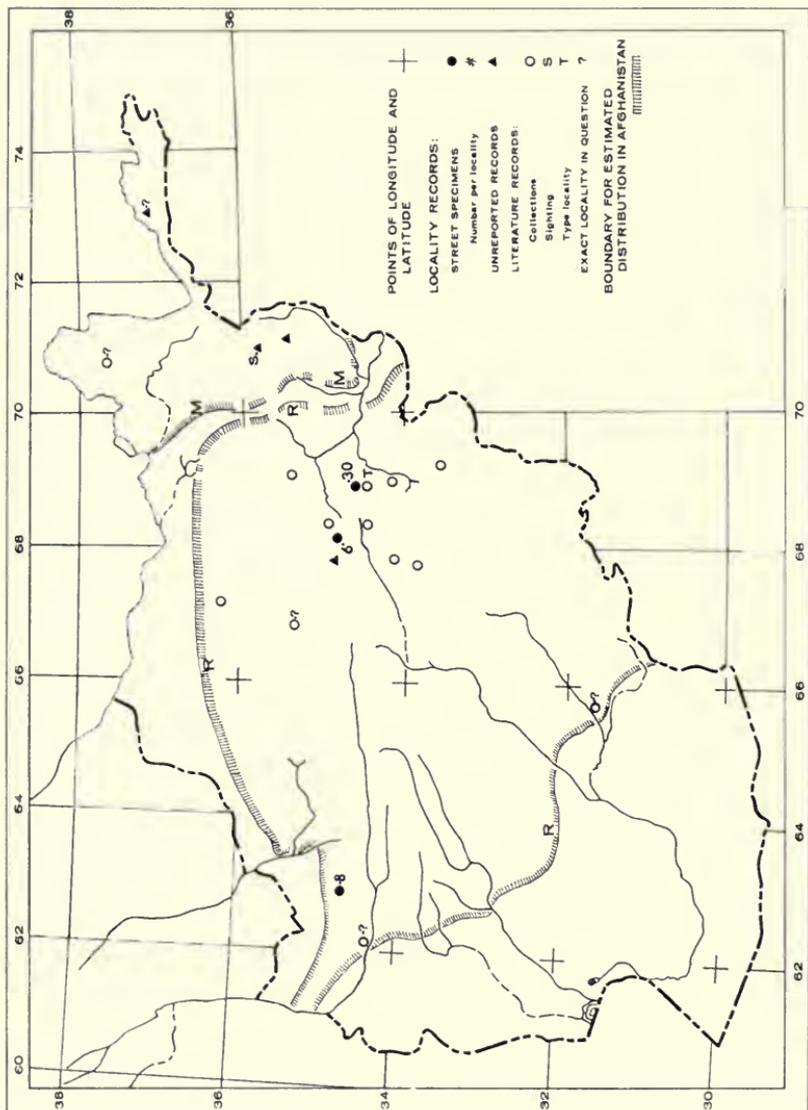


FIG. 6. Records and estimated limits of distribution for *Ochotona rufescens* (R) and *O. macrotis* (M) in Afghanistan.

AFGHANISTAN RECORDS: Gray (1842, p. 266), Hutton (1846, p. 140), Griffith (1847, p. xx), Scully (1887, p. 75), Zimmerman (1955, p. 190), Akhtar (1944, p. 82; 1957, pp. 455, 456), Niethammer (1965, p. 23), Gaisler et al. (1968, p. 186).

1965 Street Expedition: FMNH 102840-102883; in alcohol 102856, -59, -60, -61; skull only 102876, -77, -80; nestlings 102860-64.

1939 Chaworth-Musters Expedition (Shibar Pass; B. M. 47.400-47.466, 62.775, 62.776), Third Danish Expedition, 1948-1949 Central Asia (Bamian).

AFGHANISTAN HABITAT: The rock and structure biotopes between 1,000 and 3,200 m. is the favorite haunt of this pika. Free water or at least vegetation with a high density seems to facilitate its occurrence. Pikas are numerous along the roads east and west of Shibar Pass, and north and south of Sauzak Pass. I counted 60 during the late afternoon of August 25 in less than 12 km. along a road stretching west from the summit of Shibar Pass.

Taxonomic Notes and Discussion.—

The 30 specimens (FMNH 102840-869) collected near Paghman are virtual topotypes of *Ochotona rufescens rufescens* Gray, being collected less than 40 km. from the type locality. Six (FMNH 102842, 102849, 102851, 102857, 102858, 102866) are considered to be adults. A specimen is here termed adult if the greatest length of the skull minus the least distance across the top of the skull between the orbits is more than 40.0 mm. Subadults have a shorter skull length and a wider interorbital width than adults. Data from 55 *Ochotona rufescens* skulls indicate that at no time during the life of this pika is the interorbital width greater than during the first month after birth. As the skull elongates and widens the frontals constrict. For example, a nestling pika with its eyes closed had a skull length of 24.2 mm. and an interorbital width of 5.0 mm., while an adult with a skull length of 45.8 mm. had an interorbital width of 3.0 mm.

This definition of adulthood represents a morphological maturity, made for taxonomic purposes, and does not take sexual maturity into consideration; one growing female considered subadult by the above criterion had six embryos.

The dorsal pelage of four adults captured near Paghman in July appears darker and the individual hairs are shorter, 10-15 mm., when

compared with the longer hair, 20–25 mm., and the black-tipped, Cinnamon to Sayal Brown dorsal-pelage of four adults collected in late September from Sauzak Pass.

Field Notes and Discussion.—

Hunting proved to be the most effective method of collecting pikas. They were not attracted to our stock bait. Traps placed at fresh burrows failed to yield pikas. Twenty-eight specimens were shot. More than 75 per cent of them were living in the crevices of rocks supporting terraces or mountain-side irrigation ditches. At Paghman we purchased two adults, seven subadults and five nestlings between July 12 and 18; of these specimens one subadult female was lactating, a second contained six embryos. Small boys had no trouble catching pikas.

Pikas living near wheat fields store the stalks of this grain in rocky crevices; those without this source of food store grasses and weeds in relation to availability. Pikas subsist on these food-stores during the winter; they are not known to hibernate. Niethammer (1965) mentions that excavated burrows had one or two exits and ended after about 2 m. at a depth of half a meter. In winter near Paghman he also observed that they had dug tunnels up through the snow and were sunning themselves at noon.

Lepus capensis Linnaeus

Cape Hare

Lepus capensis Linnaeus, 1758, Syst. Nat., 10th ed., I, p. 58.

Type locality.—Cape of Good Hope.

Subspecies recorded for Afghanistan:

Lepus tibetanus (= *Lepus capensis tibetanus*) Waterhouse, 1841, Proc. Zool. Soc., London, 7.

Lepus lehmanni (= *Lepus capensis lehmani*) Severtzov, 1873, Mém. Soc. Amis. Sci., Moscou, 8, 2, pp. 62, 83.

Distribution.—

GENERAL: Widely distributed over Africa and Eurasia from the Cape of Good Hope north to Spain, east through Arabia and Iran to Kashmir; and through parts of the dry belt of Central Asia from Russian Turkestan east through China to approximately 120°E longitude. This species is therefore widely distributed in both the Palearctic and Ethiopian Faunal Regions and marginally in the Oriental Region.

AFGHANISTAN RECORDS: Irwin (1839, p. 1,007), Hutton (1845, p. 141), Griffith (1847, XX, pp. 366, 370), Scully (1887, p. 76),

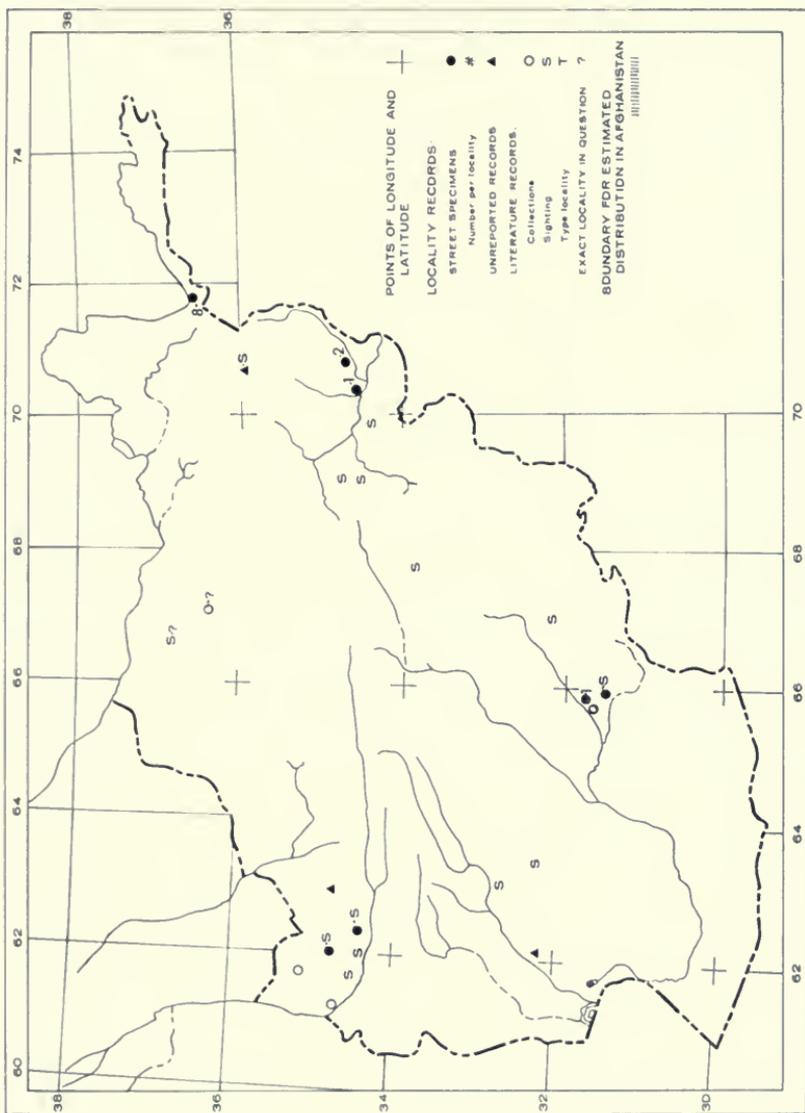


FIG. 7. The distribution records of *Lepus capensis*. This hare is found throughout Afghanistan.

Aitchison (1889, p. 61), Niethammer (1965, p. 22), Gaisler et al. (1968, p. 187).

1965 Street Expedition: FMNH 102884 to 102895.

Third Danish Expedition, 1948–1949 (Baqrabad and Faizabad in South Afgh. and Sauzak Kotal).

AFGHANISTAN HABITAT: Found between 500 and 3,000 m. throughout Afghanistan excluding alpine habitat and the forests of Monsoonal Afghanistan. We collected or saw hares in the clay and loess, slope and plateau, and rock biotopes. Hares were characteristically found in terrain with vegetation having a medium or high density, low shade, one stratum, medium to high homogeneity, and a clumped distribution.

Taxonomic Notes and Discussion.—

An examination of the obliquely truncated apex of the large maxillary incisor tooth of specimens collected near Jalalabad revealed a bell-shaped or slightly bifurcated pattern of enamel infolding. This comparatively complicated groove is filled naturally with soft cement. Skulls of other Afghan hares had a simple, shallow groove with no cement filling.

The skull length, from the most posterior point on the occiput to the anterior-most surface of the upper incisors ranges and averages: for three specimens from Jalalabad, 89.0–92.2 (91.1); for seven specimens from Wakhan, 85.2–90.5 (88.5); and one from Kandahar 82.4. The greatest distance between the outsides of the zygomata opposite the molar tooth row ranges from 40.1–42.5 for the Jalalabad hares, but only from 35.5–38.0 (36.8) for seven Wakhan skulls, and 34.3 for the Kandahar specimen.

TABLE 5.—Body measurements of *L. capensis* from Afghanistan.

(Measurements in mm.)

Record	Sample	Head and body	Tail	Hind foot	Ear ¹
Scully (1887)	1	—	—	—	109
1965 Street Exp., Jalalabad ²	3	470–540(502)	75–105(87)	115–128(120)	122–130(127)
1965 Street Exp., Wakhan and Kandahar ³	9	408–487(448)	55–97(84)	117–133(128)	98–120(107)

¹ From the notch of orifice to the tip of the ear in this genus.

² Specimens FMNH 102892, -93 and -94.

³ Specimens FMNH 102884 to 102891 and 102895.

If we follow Petter's (1961, p. 30) classification of the European and Asiatic hares of the sub-genus *Lepus*, which is based solely on the structure of the groove on the anterior surface of the first upper incisor, hares with a complex groove are assigned to the Indian species *L. nigricollis*, those with a simple groove to six other species of which *L. capensis* has the largest range. Lay (1967, pp. 153, 154) reports valid objections to uncritical use of this character, notably that Petter bases his revision on too small a sample which fails to account for age or geographic variation within the key character, and that Hall (1951, pp. 181-182) presents evidence that within a single species of this holartic subgenus *Lepus* (*Lepus*) the groove may be simple or complex dependent upon whether the specimen came from east or west of a particular range of mountains.

I have examined the incisive grooves of 89 Eurasian hares in Field Museum of Natural History, dividing them into: 1) simple grooves with no cement filling or single cement-filled invaginations similar to the one illustrated by Petter (1961, p. 34) for *L. nigricollis dayanus*; and 2) complex grooves, usually bi- or trifurcated, more complex than the one illustrated by Petter for *L. nigricollis dayanus*. Simple grooves were found in each of the 32 skulls from the Palearctic Region (Iran, Iraq, Manchuria, Mongolia). Of 48 hares collected near or in the Himalayan portion of the transition between the Palearctic and Oriental Region (south China, north India, Kashmir, and Afghanistan), 18 have simple grooves, 19 have a single invagination, and 11 have complex grooves. One hare from the Oriental Region (Indochinese Peninsula) had a single invagination, eight had complex invaginations.

Petter (1961) classified *Lepus oiostolus* and *L. ruficaudatus* as having a simple groove. In seven of ten *L. oiostolus* from Szechwan Province in western China, I do find a single invagination, but the other three have complex grooves. Complex grooves were also found in each of the sample of four *L. ruficaudatus* from north India (Assam), supporting Tate (1947, p. 202) who distinguished this species as having complex grooves. Petter acknowledges Tate's contradictory observations with a footnote but, from an examination of the type specimen, proceeds to include *L. ruficaudatus* with hares having simple grooves. It is probably noteworthy that the ranges of both *L. oiostolus* and *L. ruficaudatus* extend into the transition between faunal regions, and that Petter considers *ruficaudatus* to be related to *Lepus capensis*.

The foregoing evidence indicating that the probability of finding all complex or all simple grooves in any single taxon (species or subspecies) of hare (near the Himalayas) may be greater in either faunal region than in the transition zone between these regions, suggests that at least in the area considered the complexity of the groove on the first maxillary incisor is a geographic character having subspecific rather than specific significance.

Ellerman and Morrison-Scott (1951, pp. 421, 422) tentatively retain *L. nigricollis* as a species albeit: “. . . they have all the essential characters of [the *europaeus*] group including very large size of skull.” Ellerman speculates that *nigricollis* might represent an eastward extension of *europaeus* (= *capensis*): “However, the Southern Indian *nigricollis* with its Ceylon representative is remarkable for its black-streaked neck, and the remaining forms, which would be races of *ruficaudatus* if further specific division were required, have the upper part of the tail normally brown and white rather than black and white.”

Our Jalalabad series have incisive grooves and size and shape of skull like those of Field Museum series of *L. nigricollis ruficaudatus* from Sikkim and Assam, but their pelage resembles that of *capensis* in having Light Buff instead of Ochraceous Buff neck (as in the Sikkim one) and upper part of the tail blackish and white instead of brown and white. But the Jalalabad series is intermediate between the Afghan *L. capensis* and the *L. nigricollis ruficaudatus* in having darker, warmer dorsal body pelage than the former. Finally, the dorsal pelage of the feet and legs of the Wakhan series is almost white (Pale Pinkish Buff) whereas that of the Jalalabad series is Cream Buff or Chamois which seems much closer to the Ochraceous Tawny of the Sikkim one.

Thus, based on the evidence of intergradation provided in this paper and by Lay and on the contradictions associated respectively with Ellerman and Morrison Scott's (1951) and Petter's revisions of the subgenus *Lepus*, all hares examined from Afghanistan are considered to be *Lepus capensis*.¹ Further it is suggested that *ruficaudatus* is an Indian subspecies of *L. capensis*.

Field Notes and Discussion.—

Specimens were usually collected at night using a spotlight and shotgun, although one hare was shot in the early morning. They

¹ A young hare from Bisut, near Jalalabad, is reported as (sic) *Lepus? dayanus*, by Gaisler et al. (1968, p. 187; on the authority of Angermann, in litt.).

seemed most numerous in the Wakhan (sparsely populated by man) usually seen on small, gently sloping, alluvial plateaus between the steep mountains and the Amu Darya. We observed these hares to take refuge among rocks and boulders during the day.

Hares are hunted by the Afghans. Niethammer (1965) mentions: "*L. capensis* has become so rare because of too much hunting, that it is still not represented in the collection of the Institute of Zoology."

Order RODENTIA

Spermophilopsis leptodactylus Lichtenstein

Long-clawed Ground Squirrel

Arctomys leptodactylus Lichtenstein, 1823, Evermann. Reise, 119.

Type locality.—Karata, 140 versts northwest of Bokhara, Russian Turkestan.

Distribution.—

GENERAL: Russian Turkestan, from the east side of the Caspian Sea northeast to steppes south and east of Lake Balkash; and south to Afghanistan and northern Iran.

AFGHANISTAN RECORDS: Scully (1887, pp. 70–71), Niethammer, (1965, pp. 23–24) in alcohol 102906, -07; skull only 102915.

1965 Street Expedition: FMNH 102896-915.

Third Danish Expedition, 1948–1949 (Maimana and near Shibarghan).

AFGHANISTAN HABITAT: Collected below 1,000 m. in the clay- and loess biotope in North and Northwest Afghanistan. The prevalent vegetation of its usual habitat was characterized by: medium density, low shade, one stratum, a clumped distribution, and high homogeneity.

Discussion.—

Two species of this genus have been described from near the Afghan-Russian border, and subsequently have been reduced to subspecies. Scully (1887, p. 70) described *S. l. bactrianus* from Kamiab in North Afghanistan. Satunin (1908, p. 255) described a larger form, *schumakovi*, from Kushka Turkmeniya S.S.R. (see fig. 8). The adult Afghan specimens studied by me all fit the description of *S. l. bactrianus*, none having the length of the head and body as long as 290 mm., the figure given by Satunin (1908, p. 257) for the smallest of six adult *S. l. schumakovi*.

This steppe-dwelling rodent was quite active near 10:00 A.M. and 4:00 P.M. in August and September. Roadside hunting, using shot-guns, during periods of its peak activity was our most successful method of collecting these squirrels. They were frequently caught foraging more than 50 m. from the nearest burrow.

Marmota caudata Jacquemont

Long-tailed Marmot

Arctomys caudatus Jacquemont, 1844, Voy. dans L'Inde, 4, Zool. 66.

Type locality.—Kashmir.

Distribution.—

GENERAL: From the Hindu Kush in Afghanistan through southeast Russian Turkestan and Kashmir eastward to Sinkiang, China.

AFGHANISTAN RECORDS: Griffith (1847, pp. 388, 483), Anderson (1875, p. 283), Furse (1963, p. 22), Niethammer (1965, p. 24), Povolny and Daniel (1966, p. 371).

1965 Street Expedition: FMNH 102916, a patch of dorsal fur.

Third Danish Expedition, 1948-1949 (Pashki, Puistagoli).

In addition to obtaining specimens as cited above, Paludan (Third Danish Expedition field notes) observed marmots at Pashki, 2,700-3,600 m.; Stiewe; near Sanglich, 3,500 m.; Weran Pass, 3,460 m.; and Shibar Pass, 2,440 m., between May 18 and July 25 in 1948 and 1949. He notes the absence of marmots on a subsequent return to the Shibar Pass in October, albeit: "there were many dens and we had encountered them before."

AFGHANISTAN HABITAT: Above 2,500 m. in sub-alpine biotopes. Niethammer (1965, pp. 25, 26) reports: ". . . it occurs in the Hindu Kush above 2,800 m. and probably also in the Pamirs, where it is numerous on the Russian side. The most southern record is in the Dasht-i-Newar, where its extensive burrows were found, especially on the borders of wet plains which have a rich vegetation in summer." Paludan (*supra cit*) saw reddish-brown marmots southwest of Zebak (near Sanglich, 3,500 m.) on an "artemisia steppe." He also notes seeing and hearing marmots near Pashki in: "juniper-habitat above the forest." Povolny and Daniel (1966) collected marmots on an "Alpine artemisia-steppe" in the valley of Chap Darrah, 3,700 m.

Discussion.—

Povolny and Daniel (1966) collected marmots on Aug. 15 and 18, 1965, in the Wakhan Region. On Aug. 17 and 18, 1965, the Street Expedition was also collecting in the Wakhan Region, approximately 800 m. lower than Povolny and Daniel, but encountered no marmots. Subsequently, our expedition never entered good marmot habitat until close to or after the onset of hibernation, and then only briefly. Consequently, our only record consists of a patch of fur said to have come from a marmot collected on the Anjumin Pass.

Spermophilus fulvus Lichtenstein Fulvous Ground Squirrel

Arctomys fulvus Lichtenstein, 1823, Evermann Reise, 119.

Type locality.—U.S.S.R., Kirghizia, River Kuwandzaliur, east of the Mugadsharz Mountains, north of the Sea of Aral.

Distribution.—

GENERAL: South Russia to Chinese Turkestan with the southern limits of its distribution in north Iran and Afghanistan.

AFGHANISTAN RECORDS: Niethammer (1965, p. 24).

Third Danish Expedition, 1948–1949 (Ab-i-Istada).

AFGHANISTAN HABITAT: Niethammer (1965, pp. 24, 25) states: "It is sporadically distributed in more sandy steppes between 1,000 and 3,000 m. altitude. . . ."

Discussion.—

At the time of our visit to localities where this species has been collected or is thought to occur, the animals had already entered aestivation or hibernation. Kashkarov and Lein (1927, p. 65) give the time of activity for this species as February to June. Their observations were made in Russian Turkestan, north of Afghanistan.

Because few burrows large enough to house this squirrel were seen, this species is probably rare or absent beyond areas from which they were collected in South and East Afghanistan. Although too few collecting excursions have been made to *Spermophilus* habitat—during their short burst of activity—to ascertain their range in Afghanistan, they appear to have a sporadic distribution with, perhaps, two disjunct populations. Lay (1967, p. 157) indicates a disjunct distribution for this species in Iran. This sporadic and possibly insular distribution along the southern limit of this species range probably reflects more favorable ecological conditions and a wider distribution in the past.

TABLE 6.—Body measurements of Scuriidae from Afghanistan.

(Measurements in mm.)						
Genus	Record	Sample	Head and body	Tail	Hind foot	Ear
<i>Spermophilopsis</i>	Scully (1887) ¹	1	241	38	56	—
	Niethammer (1965)	4	230-270	27-81	59-62	—
	1965 Street Exp. ²	13	219-270(243)	59-86(74)	61-68(65)	—
<i>Marmota</i>	Anderson (1875) ²	1	520	165	—	—
	3rd Danish Exp. ⁴	1	—	—	80	—
<i>Spermophilus</i>	Niethammer (1965)	4	430-510	180-230	80-94	16-25
	Niethammer (1965)	5	230-340	85-102	52-70	—
	Niethammer (1967)	7	250-310(288)	260-320(300)	57-62(60)	38-47(42)
<i>Pelautrista</i>	Niethammer (1967)	1	320	340	63	40

Measurements of the type for *S. l. bactrianus* Scully, 1887.

² All 13 are adults.

³ The type of *Arctomys dichrous* Anderson, 1875 (= *M. caudata dichrous*).

⁴ Measurements of a dried hind foot.

Hylopetes fimbriatus Gray Smaller Kashmir Flying Squirrel

Sciuropterus fimbriatus Gray, 1837, Ann. Mag. Nat. Hist., I, p. 584.

Type locality.—Northwest India, Punjab, Simla.

The following species previously recorded from Afghanistan is considered (*vide* Ellerman and Morrison-Scott, 1951) to be a subspecies of *H. fimbriatus*.

Sciuropterus baberi Blyth, 1847, Jour. Asiat. Soc. Bengal, 16, p. 866.

Type locality.—Afghanistan: Nijrow in Kohistan.

Distribution.—

GENERAL: Northwest India, Kashmir, north West Pakistan, and Monsoonal Afghanistan.

AFGHANISTAN RECORDS: Babur in the sixteenth century A.D. (Memoirs translated and published in 1921, p. 233), Blyth (1847, p. 866), Horsfield (1851, p. 163), Blanford (1888–1891, p. 367), Niethammer (1967).

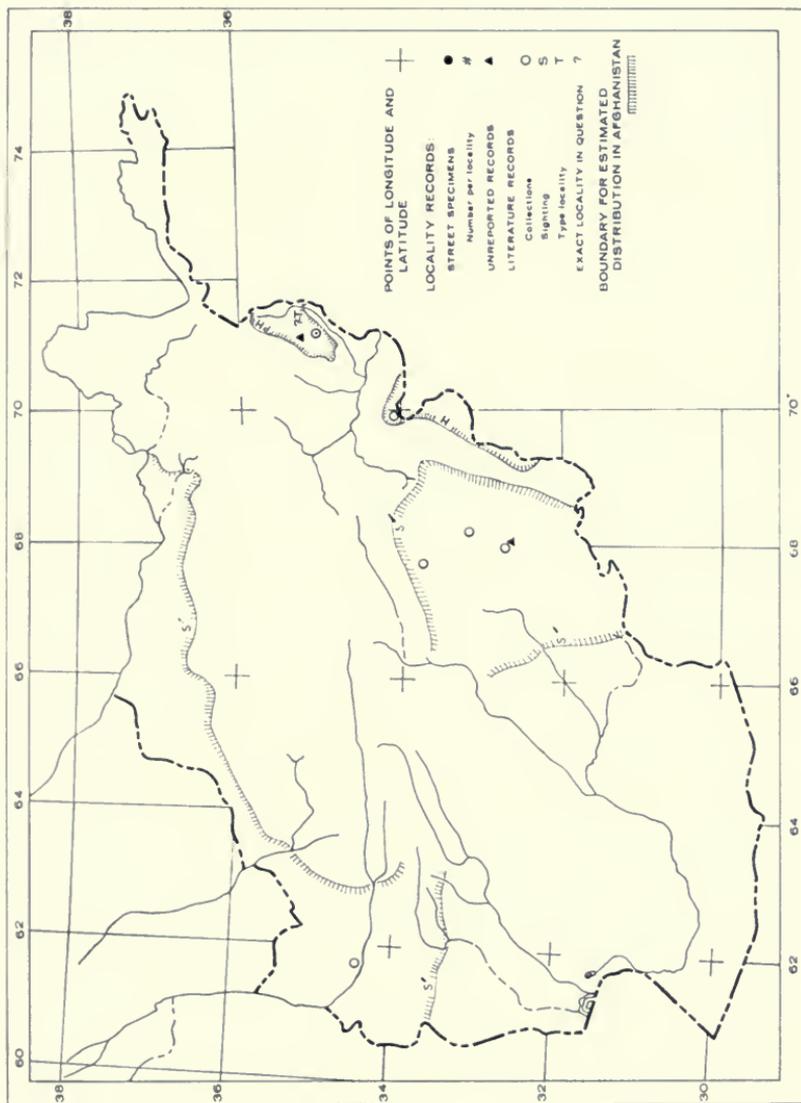
Third Danish Expedition, 1948–1949 (Stiewe, Nuristan).

AFGHANISTAN HABITAT: Locally abundant between 1,600 and 3,500 m. in the evergreen oak and conifer biotopes of Monsoonal Afghanistan and Nuristan.

Discussion.—

Babur (1921, p. 233) saw “. . . an animal larger than a squirrel, with a kind of leathern web stretching between its fore and hind feet like a bat's wing,” in the mountain districts of Nijrow. He called it the flying-fox. Blyth (1847, p. 866) describes the type for *H. f. baberi* from this same general locality as follows: “A species seemingly allied to *Sc. fimbriatus*, but one-fourth larger, was figured by Sir A. Burnes as *Moosh i baldar* of the mountain districts of Nijrow, and identified by him as the “Flying Fox” of the translation of Babur's (1921, p. 145) memoirs. A length of two feet is assigned to it whereas I doubt (from examination of several specimens) if *Sc. fimbriatus* would ever exceed 19 in. at the most. The color of the upper-parts is represented as pale fulvescent ashy-brown, darker on the limbs; tail broad and bushy, and tipped with blackish; underparts dull white, with a ferruginous margin to the membrane underneath.”

FIG. 9. Records and estimated limits of distribution for *Spermophilus fulvus* (S'), *Hylopetes fimbriatus* (PH and H), and *Petaurista petaurista* (PH). Circle with dot circumscribes the locality wherein Niethammer (1967) collected seven *Hylopetes* and one *Petaurista*, and denotes the *only* Afghanistan record for *Petaurista*. The distribution for *Spermophilus* may be disjunct.



Blanford (1888-1891, p. 367), discussing the distribution of this species notes: "Also found in Afghanistan, a specimen having been brought from Peiwar Kotal."

The Third Danish Expedition bought a skin in Stiewe, Nuristan. This skin is in rather bad condition, however, its pelage is similar in virtually every respect to the pelage of two *fimbriatus* (FMNH 43504 and 91262) from Kashmir. Stiewe is a village in the Pech River valley.

Niethammer (1967) confirmed the existence of flying squirrels in the Pech valley. He collected seven *H. f. baberi* between Aug. 26 and 29 from the transition zone between the evergreen oak and conifer biotopes, near 2,000 m. Sensa-Nuristan. These specimens are virtual topotypes of this subspecies.

According to Niethammer (1967): "We located these squirrels by the accumulation of acorns under the trees in the day time while at night we flashed the light as soon as we heard them gnawing and were able to see them without any difficulty as their eyes shine in the dark." He notes most of the oak trees were hollow or with many holes. The Street Expedition found no evidence of the presence of any squirrels living in the oak biotope along the Bashgul River (1,300-2,150 m.), about 75 km. northeast of Sensa-Nuristan. The Bashgul River, like the Pech, is a tributary of the Kunar River, which flows into the Indus River via the Kabul River. I examined many oak trees on mountains along the Bashgul River; tree holes were scarce and most of the trees were not hollow.

Petaurista petaurista Pallas Common Giant Flying Squirrel

Sciurus petaurista Pallas, 1766, Misc. Zool., p. 54.

Type locality.—Western Java.

Distribution.—

GENERAL: Indian Faunal Region and Monsoonal Afghanistan.

AFGHANISTAN RECORDS: Niethammer (1967).

AFGHANISTAN HABITAT: Niethammer collected a single specimen from the ecotone between the evergreen oak and conifer biotopes, near 2,000 m. elevation, and collected seven *Hylomyscus fimbriatus* in the same general locality; i.e., "in Sensa-Nuristan, East Afghanistan."

Discussion.—

Niethammer collected the first and only specimen of this species in Afghanistan. He identified the specimen as belonging to the subspecies *Petaurista petaurista albiventer* Gray, 1834, Illustr. Ind. Zool pl. xviii. Type skull in B.M., labelled Nepal. This record represents the westernmost collection of this species. Dr. Niethammer notes that *Hylopetes* and *Petaurista* live together not only in Afghanistan, but also in Kashmir, where they are equally abundant and show no niche differentiation.

Calomyscus bailwardi Thomas

Long-tailed Hamster

Calomyscus bailwardi Thomas, 1905, Abstr. Proc. Zool. Soc., London, 23, pp. 524-526.

Type locality.—Iran, Khusistan, Province, Mala-i-Mir.

Distribution.—

GENERAL: This species is known from the Iranian Plateau, southern Transcaucasia, and South Russian Turkestan.

AFGHANISTAN RECORDS: Ellerman (1948, p. 118), Zimmerman (1955, p. 191), Niethammer (1965, p. 32), Gaisler et al., (1967, pp. 359, 361).

1965 Street Expedition: FMNH 102917-103003; in alcohol 102943, -49, -58, -63, -66-69, -79, -91-93, -97, -99; skull only 102932, -33; skin only 192949.

Third Danish Expedition, 1948-1949 (Wama).

AFGHANISTAN HABITAT: Widely distributed between 400 and 3,500 m. in the rock biotope. There is no obvious correlation between the kind or amount of vegetation and the distribution of this cricetine. It was as abundant under the evergreen oaks of Monsoonal Afghanistan as it was in the barren, scorched hills north of Kandahar. All of the 87 specimens collected by the Street Expedition were taken from rocky terrain. It was conspicuously absent from its typical habitat where we trapped in Badakshan and the Wakhan.

Discussion.—

Measurements of the type for *C. bailwardi mustersi* Ellerman, 1948, Proc. Zool. Soc., London, 118, 3, p. 804, collected at Paghman, Afghanistan are: HB, 86; T, 88; HF, 20; and E, 18.

The tone of the dorsal pelage of adult and juvenile *C. b. mustersi* is respectively grizzled Drab and Pale Smoke Gray. Dorsally, the

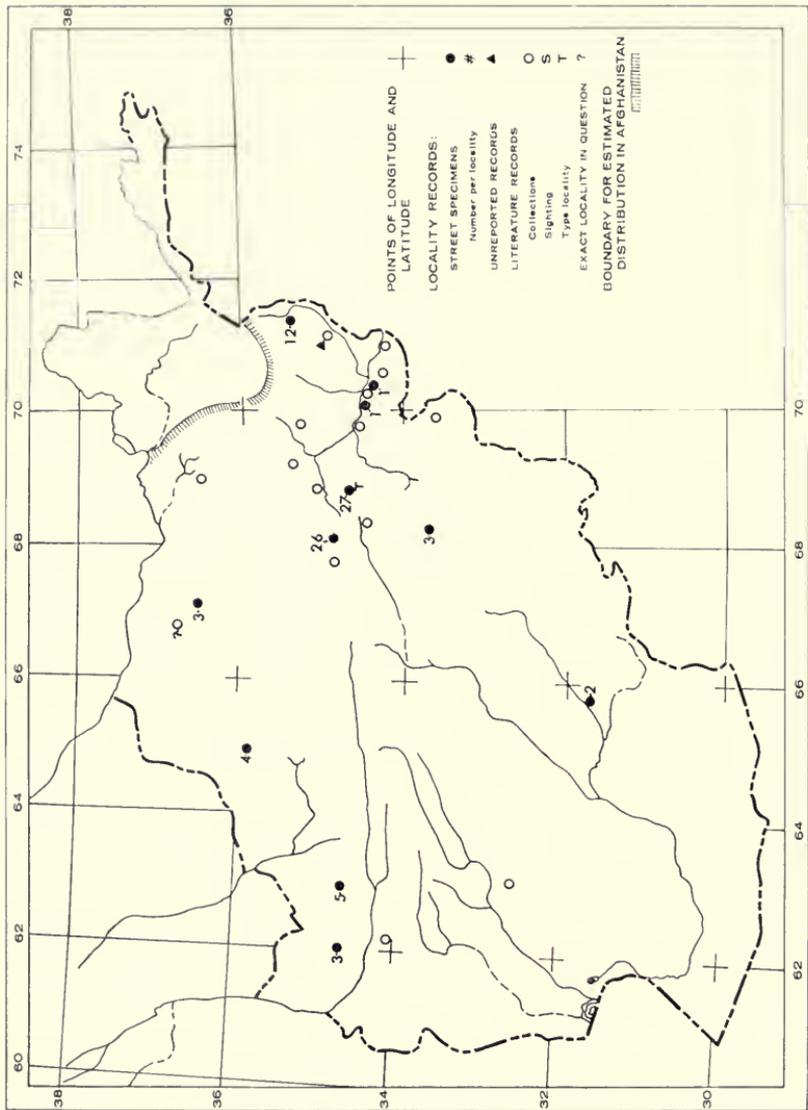


FIG. 10 The records and estimated limits of distribution for *Calomyscus bailiardi*.

TABLE 7.—Body measurements of Cricetinae from Afghanistan.

(Measurements in mm.)

Species	Record	Sample	Head and body	Tail	Hind foot	Ear
<i>Calomyscus bailwardi</i>	Ellerman (1948)	14	84-89 (85)	72-90 (86)	19-21 (20)	17-20 (18)
	Niethammer (1965)	30	83-96	85-102	20-22	17-20
	1965 Street Expedition ¹	27	61-94 (84.8)	79-100 (88.1)	20-23 (21.5)	16-20 (18.3)
		60	69-98 (84.5)	79-97 (87.8)	18-22 (21.1)	15-21 (18.8)
<i>Cricetulus migratorius</i>	Niethammer (1965)	12	99-120	19-30	14-16	15-19
	1965 Street Expedition	58	77-121 (100)	17-37 (22.3)	11-17 (16.1)	16-21 (18.1)

¹ Measurements are of 27 topotypical *C. b. mustersi* and 60 specimens from other Afghan localities.

progression of molt from juvenile to adult pelage is from the head to the base of the tail, and simultaneously, from the flanks to the mid-dorsal region.

When compared with the grizzled Drab dorsal pelage of specimens from Central Afghanistan, adults from North and Monsoonal Afghanistan have respectively lighter and darker pelage.

Each of two females, taken July 16 and 17, had three embryos.

A well-drained slope covered with boulders was the favorite habitat of *Calomyscus*, however, 300 trapnights in typical habitat (Aug. 12-18, 1965) failed to yield any *Calomyscus* in Badakshan and the Wakhan.

Seed husks mixed with mouse-like droppings, usually under a ledge of rock, often betrayed the presence of *Calomyscus*. A close examination of these husks revealed they were from different species of herbs or grasses. In Monsoonal Afghanistan a trap baited with an acorn and set under a ledge amidst a small pile of empty acorn shells and mouse droppings did yield a *Calomyscus*, and because I trapped no other rodent in that vicinity which was the size of *Calomyscus*, it seemed evident to me that the acorns were used for food by this species.

Cricetulus migratorius Pallas

Gray Hamster

Mus migratorius Pallas, 1773, Reise, 2, p. 703.

Type locality.—Western Siberia in the Lower Ural River Valley.

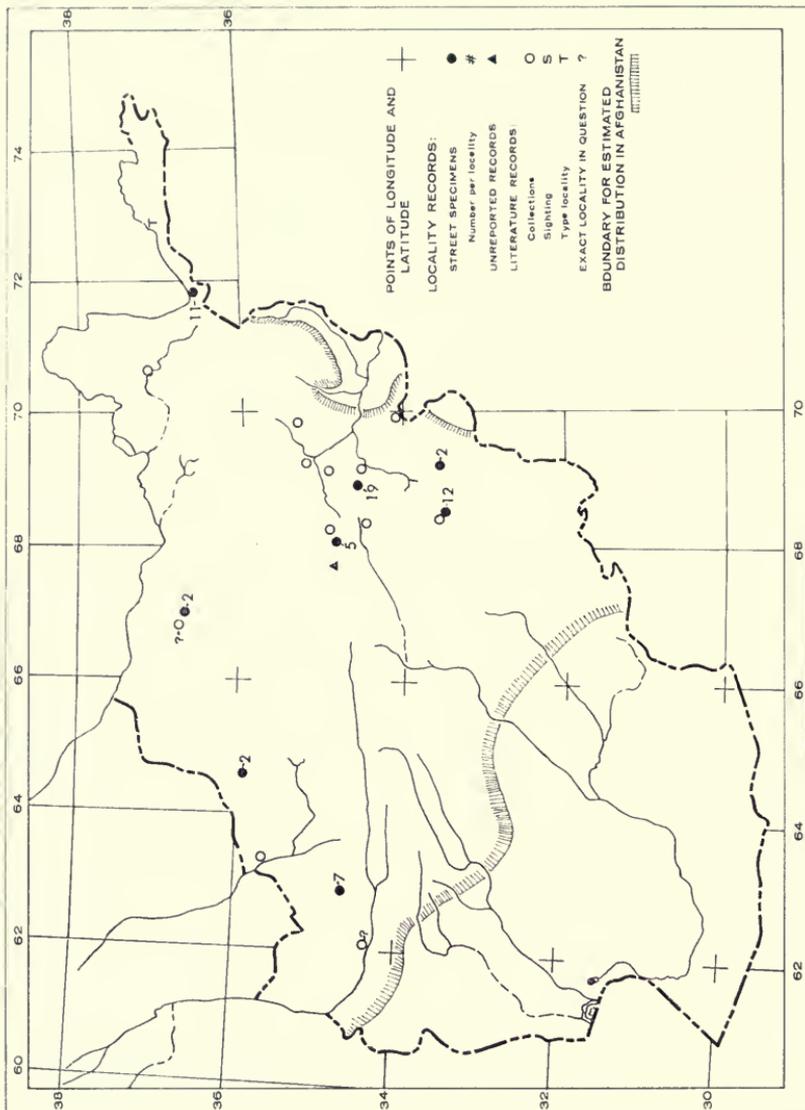


FIG. 11. The records and estimated limits of distribution for *Cricetus migratorius*.

Cricetus (Cricetulus) fulvus reported for Afghanistan in Wakhan by Blanford (1875, p. 108), and as *Cricetus phaeus* by Sclater (1891, p. 85) is considered a subspecies of *Cricetulus migratorius* by Ellerman and Morrison-Scott (1951, p. 622).

Distribution.—

GENERAL: Greece and southern Russia from the Ukraine through Russian Turkestan southeast to Kashmir and Baluchistan, north and east to Chinese Sinkiang and southwestern Siberia.

AFGHANISTAN RECORDS: Blanford (1875, p. 108), Aitchison (1889, p. 59), Ellerman (1948, p. 806), Niethammer (1965, p. 32), Gaisler et al. (1967, p. 361).

1965 Street Expedition: FMNH 103004—33, -35, -59, -61-64; in alcohol 103012, -14, -15, -30, -33, -35, -40; skull only 103004.

Third Danish Expedition, 1948-1949, (Bamian).

AFGHANISTAN HABITAT: This species occurred between 400 and 3,600 m. in the rock, slope-and-plateau, and structure biotopes, and was frequently found in sites almost devoid of vegetation. Few were taken in humid habitat.

Niethammer (1965) mentions that *C. migratorius* were collected in the coniferous forest at Peiwar Pass, and the present expedition collected six specimens from a juniper woodland on Sauzak Pass. However, we obtained none in South or Monsoonal Afghanistan or in the Jalalabad Vale.

Discussion.—

A pregnant female containing six embryos, and two lactating females were trapped on August 15 and 16.

Cheek-pouches usually contained seeds. One specimen weighing 28 gm. had 4.5 gm. of legume leaves, seeds, and seedpods in its cheekpouch.

We found this species to be easily obtained by placing traps at holes in the dry, earthen embankments of fallow terraces or near cracks and crevices in the hard-clay foundations of abandoned buildings. In the Wakhan region it was abundant in the rock biotope.

Alticola roylei Gray

Royle's High Mountain Vole

Arvicola roylei Gray, 1842, Ann. Mag. Nat. Hist., 10, p. 265.

Type locality.—India, Kumaon.

Distribution.—

GENERAL: Tianshan, Pamir, and Hissar Mountains in southern and eastern Russian Turkestan, east to Mongolia and south to northwestern India, W. Pakistan, and Afghanistan.

AFGHANISTAN RECORDS: Ellerman (1948, p. 782), Zimmerman (1955, p. 191), Niethammer (1965, p. 35; 1970, p. 14).

1965 Street Expedition: FMNH 103065-78; in alcohol 103077, -78; skull only 103074.

AFGHANISTAN HABITAT: This montane species occurs between 2,000 and 4,300 m. in the watercourse and rock biotopes. Characteristic vegetation: high density, medium to high shade, one to three strata, irregular distribution and low homogeneity.

Discussion.—

Twenty traps placed among the rocks and thick vegetation bordering a swift stream in the Wakhan yielded four specimens within 4 sq. m. I was unable to find five of the 20 traps. Presumably they were sprung by voles and in turn stolen by a predator or dragged under the rocks by the vole. A sixth trap containing a large vole was dragged a meter before it wedged between rocks. This vole was caught by the hind quarters and was still alive. Traps set for this species should be anchored to a rock or vegetation with wire or cord.

The banana-shaped fecal pellets of this species literally covered the earth under certain large rocks. For 50 m. along this stream, I noted feces under every rock and on top of many low, flat rocks.

Microtus (Blanfordimys) afghanus Thomas Afghan Vole

Microtus (Phaiomys) afghanus Thomas, 1912, Ann. Mag. Nat. Hist., 9, p. 349.

Type locality.—Gulran, 35.06 N, 61.41 E, Afghanistan.

Golunda mellada Gray (in Horsfield, 1851, p. 144).

Arvicola mandarinus Milne-Edwards (Blanford, 1881, p. 108; Aitchison, 1889, p. 59).

Distribution.—

GENERAL: The Transcaspian and Kara Kum basins below 40°N latitude from the Caspian Sea east through southern Turkmeniya and Uzbekistan to southwestern Tadjikistan. South through the mountains in Central and East Afghanistan.

AFGHANISTAN RECORDS: Horsfield (1851, p. 144), Aitchison (1889, p. 59), Ellerman (1948, p. 783), Niethammer (1965, p. 36; 1970, p. 2).

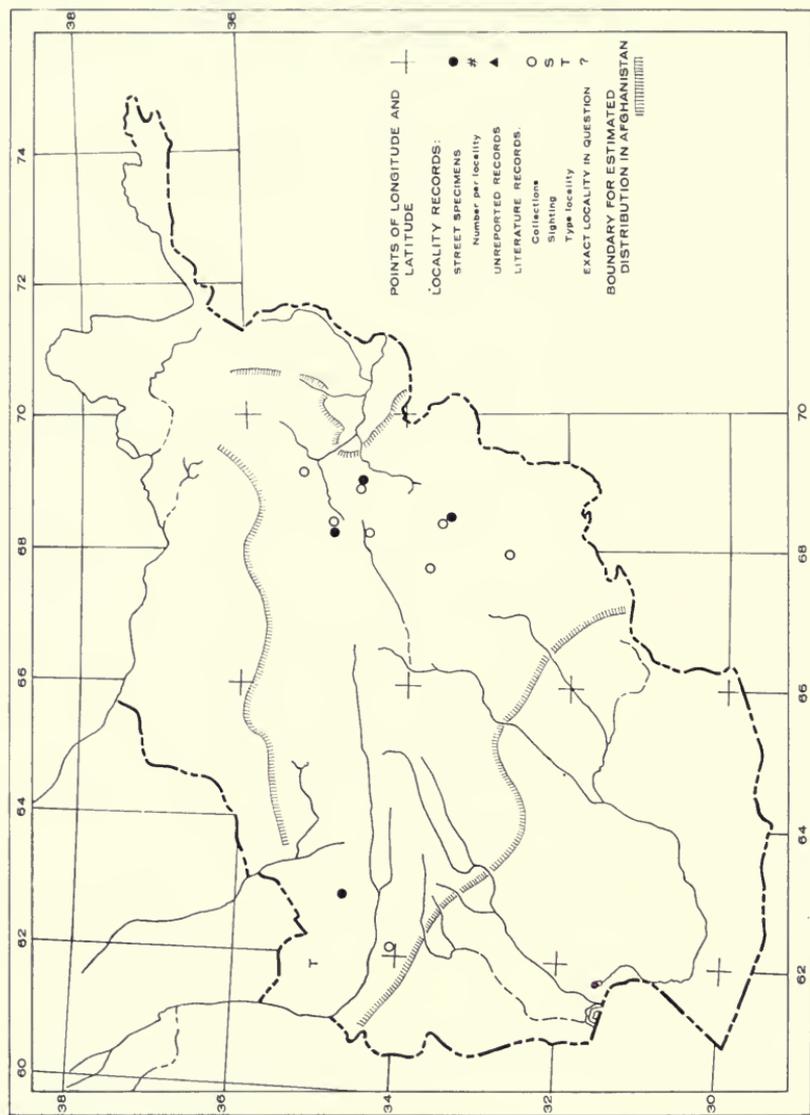


FIG. 13. Records and estimated limits of distribution for *Microtus afghanus*.

1965 Street Expedition: FMNH 103079-125; in alcohol 103092, -113, -122, -123; skull only 103097, -112.

AFGHANISTAN HABITAT: Common in the clay-and-loess, structure, and watercourse biotopes below 3,400 m. Characteristic vegetation: high density, low to high shade, one or two strata, irregular distribution, low to high homogeneity. It has not been collected in North and South Afghanistan or beyond 25 km. east of a line running through Ghazni and Kabul.

Taxonomic Notes and Discussion.—

A vole collected by Griffith and reported as *Golunda meltada* Gray by Horsfield (1851, p. 144) was reidentified as *Arvicola mandarinus* Milne-Edwards by Blanford (1881, p. 101), whose determination was followed by Thomas (*in* Aitchison 1889, p. 59) in his identification of two additional specimens collected by Aitchison in 1885. Subsequently, Thomas (1912, p. 349) reconsiders, saying: "Renewed examination of the specimens with modern knowledge and materials shows that the species belongs to quite a different group from *M. mandarinus* and clearly needs description as new." Hence, Thomas described *Microtus afghanus*.

Ellerman (1941, p. 226), who examined two skulls and the literature, considers *Microtus afghanus* to be *Blanfordimys afghanus*. *Blanfordimys* was originally described as a subgenus of *Microtus* by Argiropulo (1933, p. 182). Ognev (1950, p. 306), examining 41 pelts and skulls, retains *Blanfordimys* as a subgenus. I have followed Ognev's classification for the microtine fauna of Afghanistan.

Field Notes and Discussion.—

At least 31 of the 46 *M. afghanus* collected were trapped in the proximity of the structure biotope, particularly along the edges of fallow terraces. The results of our trapping supports Niethammer's (1965, p. 36) observation for Afghanistan: "In higher altitudes it lives in stony areas and also penetrates into drier biotopes than *Alticola* and *Microtus arvalis*."

On Sauzak Pass at 2,400 m. the author saw more than 100 *Microtus*-like burrows in approximately 25 sq. m. These burrows emerged around the edges of dense hemispherical crowns of tragacanthoid vegetation. Seventy trap-nights yielded a number of migratory hamsters and a single *Microtus*. On the Shibar Pass at about 2,500 m. two *Microtus* were dug out of a small nest about 300 mm. deep. The burrow system consisted of a single tunnel, 100-300

TABLE 8.—Body dimensions of *Alicola* and *Microtus* from Afghanistan, Iran, and Southern U.S.S.R.

(Measurements in mm., except as noted)						
Species	Records	Sample	Head and body	Tail	Hind foot	Ear
<i>A. roylei</i>	Ellerman (1948)	1	117	48	18	12
	Zimmerman (1955)	2	107	50	19	16
	Niethammer (1965)	10	102-125	43-53	18-21	15-19.5
	1965 Street Exp.	14	95-115(104)	40-57(47)	19-22(20)	12-17(15)
<i>M. afghanus</i>	Thomas (1912) ¹	1	93	23	16.5	9
	Ellerman (1948)	26	90-121(106)	20-30(24)	13-18(16)	9-11(10)
	Niethammer (1965)	10	98-121	22-30	16-18	9-12
	1965 Street Exp.	26 ²	95-116(106)	21-28(23)	15-21(18)	8-12(10)
<i>M. arvalis</i>	Ellerman (1948)	3	114-125(120)	39-48(43)	19-20(19)	12-14(13)
	Niethammer (1965)	5	103-125	36-43	18-19.5	11-13
	1965 Street Exp.	6 ²	118-131(124)	39-44(41)	19-21(20)	12-14(13)
	Lay (1967) ³	10	92-109(101)	29-38(34)	17-19(18)	11-13(12)
<i>M. socialis</i>	Scully (1887)	1	4.4''(112)	—	0.77''(19.6)	0.4''(10)
	3rd Danish Exp. ⁴	1	92	23	16	8
	Ognev (1950) ⁵	81	94-126	22.6-29.2	16.6-19.0	9.8-14
<i>M. juldaschi</i>	1965 Street Exp.	1 ²	107	31	19	13
	3rd Danish Exp.	1	92	31	18.5	11

¹ Dimensions of the type (measured on the alcohol specimen): BMNH 86.10.15.11; an adult female in alcohol.

² Adults.

³ Doab, Tehran Province, Iran; 1962 Street (FMNH) specimens.

⁴ Measured on the alcohol specimen.

⁵ Specimens from southern U.S.S.R.

mm. deep, with a series of lateral passages and exits. This subterranean passage ran parallel to the edge of a fallow wheat field.

A female trapped on July 25 contained four embryos. Twenty subadults were trapped in July, but none thereafter, although adults were trapped in August, September, and October.

Microtus arvalis Pallas

Common Vole

Mus arvalis Pallas, 1779, Nov. Spec. Quad. Glir. Ord., p. 78.

Type locality.—Germany.

The following species previously recorded from Afghanistan is considered to be a subspecies of *Microtus arvalis*.

Microtus transcaspicus Satunin, 1905, Verz. Säug. Transkaspiens (Russ), 25, p. 30. Tschuli Gorge, near Ashabad, Transcaspia.

Distribution.—

GENERAL: Temperate zone of Europe and Asia reaching its southern limit of distribution in Afghanistan.

AFGHANISTAN RECORDS: Ellerman (1948, p. 789), Niethammer (1965, p. 36; 1970, p. 11).

1965 Street Expedition, FMNH 103126-150; in alcohol 103140, -46.

AFGHANISTAN HABITAT: Found on mountains in the water-course and clay-and-loess biotopes. The Street Expedition collected 25 specimens in approximately 25 sq. m. of a seepage on Shibar Pass shown in Hassinger (1968, fig. 13). They were not taken beyond the lush grass of this biotope, but *Microtus afghanus* were collected in the drier perimeter of this seepage, less than 8 m. beyond the center of *M. arvalis* activity as indicated by runways and trapping success. Niethammer (1965) states: "In contrast to Central Europe they [*arvalis*] occur in Afghanistan only sporadically in relatively humid localities and rarely on cultivated land." He gives their vertical distribution as 2,500–3,000 m.

Discussion.—

Ellerman (1948, p. 789) provisionally identified three large voles collected by Chaworth-Musters on the Shibar Pass as *Microtus transcaspicus*. Ognev (1950, p. 184) considers *transcaspicus* to be a subspecies of *M. arvalis*. Niethammer (1965, p. 36) concurring, considers the specimens collected by Chaworth-Musters to be: "typical field voles, differing little from other large subspecies of

M. arvalis." A superficial comparison of teeth, bullae, and skull dimensions of *M. arvalis* from Iran with specimens from Afghanistan supports Niethammer's judgement, i.e., adult voles from Afghanistan are similar to adult *M. arvalis* from Iran (Lay, 1967), but, as shown in Table 8, larger.

The overall appearance of the dorsal pelage of adults collected in July is Buffy to Olive Brown. Subadults have darker pelage with more black hairs than adults, which, in turn, have darker pelage than neighboring *Microtus afghanus*.

Six subadults, seemingly from the same litter, were phenotypically alike but different from the other 19 voles. These six appear to have a black moustache in that the pelage around the base of the mystacial vibrissae and above the nose is black contrasting with adjacent Buffy Brown pelage.

We collected six adults and 19 subadults in July. The grass of the swale inhabited by these voles was etched with well-worn trails. Voles were collected by placing traps in these runways. Setting our traps at dusk produced 15 specimens within an hour. Burrows and runways in drier soil adjacent to the swale yielded three *Microtus afghanus* in the same period of time.

Microtus socialis Pallas

Social Vole

Mus socialis Pallas, 1773, Reise Russ. Reich., 2, p. 705.

Type locality.—U.S.S.R.: Grassy regions of desert by Ural River.

Arvicola guentheri Danford and Alston, 1880, Proc. Zool. Soc., London, p. 62.

Type locality.—Turkey: Marash.

Distribution.—

GENERAL: From the Ukraine south to Lybia and east to Russian Turkestan and Afghanistan.

AFGHANISTAN RECORDS: Scully (1887, p. 72).

Third Danish Expedition, 1948–1949 (Gilzai—in the Koh-i-Baba Mountains).

AFGHANISTAN HABITAT: Montane and Steppe biotopes. Ognev (1950, p. 322) remarks: "The animal [*M. socialis*] does not avoid low and sometimes moist valleys . . ., dry watershed steppes, semi-deserts and deserts, river valleys, and finally high plateau steppes . . ."

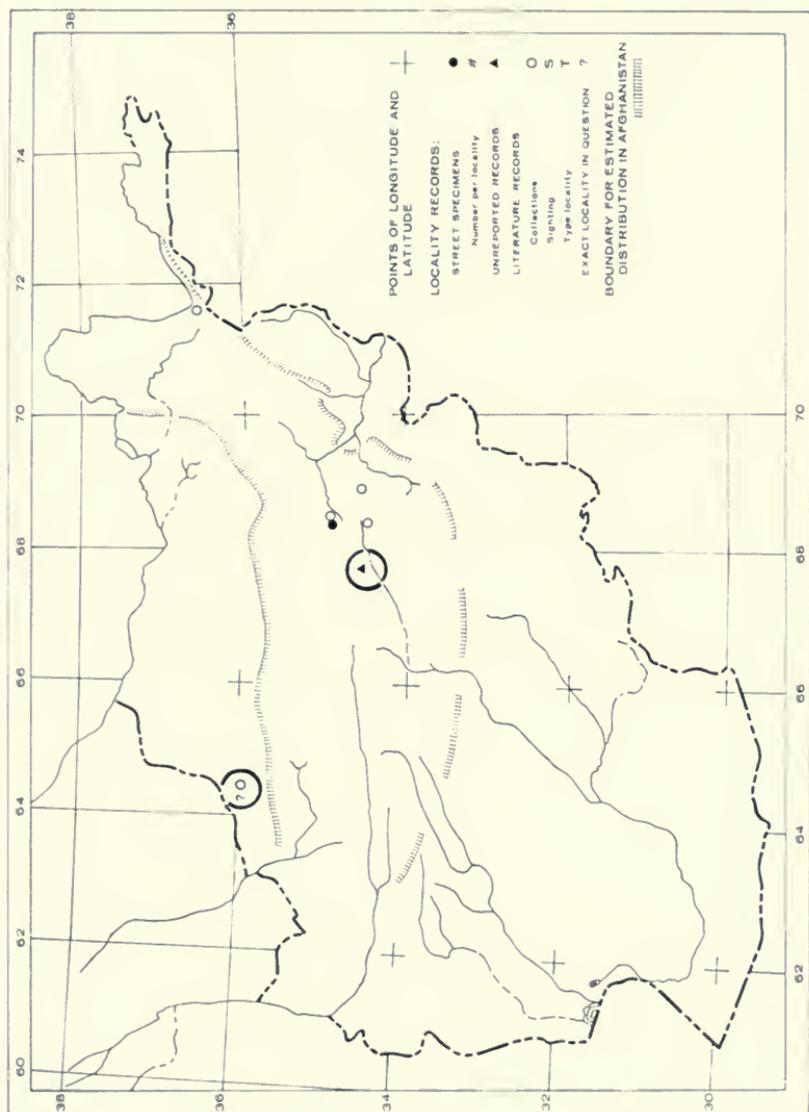


FIG. 14. Two records (circled) for *Microtus socialis* and records and estimated limits of distribution for *Microtus arvalis*.

Discussion.—

A single specimen collected by C. E. Yates of the Afghan Boundary Commission in Afghan Turkestan (=North Afghanistan) was identified as *Arvicola guentheri* by Scully (1887, pp. 72-73). A second vole was taken in August, 1948, in the Koh-i-Baba Mountains northwest of Kabul. This specimen represents a range extension of approximately 200 km. southeast of the nearest previously recorded locality for this species.

Ognev (1950, p. 342) refers specifically to the specimen collected by Yates and described by Scully, and postulates that *M. guentheri* is a subspecies of *M. socialis*, a synonym of the subspecies *M. socialis paradoxus* Ognev and Geptner (1928). Lay (1967, p. 167) presents much further evidence from specimens of Iran and Turkey supporting conspecificity of *M. guentheri* with *M. socialis*.

Microtus juldaschi Severtzov

Pamir Vole

Arvicola juldaschi Severtzov, 1879, Zapiski Turkest. Ot. Obs. Lub. Estest, I, p. 63.

Type locality.—Lake Karakul, in Pamir Mountains, Tadzhik S.S.R.

Distribution.—

GENERAL: The Pamir Mountains in Tadzhikistan, and Hindu Kush Ranges in northeast and central Afghanistan.

AFGHANISTAN RECORDS: Niethammer (1970, p. 10).

1965 Street Expedition, FMNH 103118, -19, 20 miles SW of Eshkashem along the Faizabad-Eshkashem road.

Third Danish Expedition, 1948-1949 (Panjao)

AFGHANISTAN HABITAT: Pamir Voles were collected above 2,000 m. in montane habitat. Ognev (1950, p. 301), citing M. P. Pozanov, writes: "This Pamir endemic lives where wet meadows and alpine glens occur along rivulets and streams." I collected two at approximately 2,700 m. in the watercourse biotope which supports his generalization. However, he adds that this vole is not highly discriminating in choosing stations. The perennial stream along which these two were collected was large enough that it supported trout. The clay banks of this stream and the surrounding meadow were covered with alfalfa.

Discussion.—

The Third Danish Expedition's record represents a range extension of approximately 400 km. southwest of the nearest previously recorded locality for this species.

An adult and juvenile were collected by the Street Expedition August 18 at the same spot, one at 10:00 P.M., the other around 7:00 A.M. The adult had two embryos.

Mice of the genus *Microtus* were not generally attracted to our usual bait. The two specimens of *M. juldaschi* were each captured in a trap placed in a streamside runway.

Ellobius fuscocapillus Blyth

Afghan Mole-Vole

Georychus fuscocapillus Blyth, 1842, Jour. Asiat. Soc. Bengal, **10**, p. 928, *nom. nud.* 1843, Jour. Asiat. Soc. Bengal, **11**, p. 887.

Type locality.—Quetta, Baluchistan.

Ellobius intermedius Scully, 1887, Jour. Asiat. Soc. Bengal, **56**, p. 73.

Type locality.—Herat, Afghanistan.

Distribution.—

GENERAL: Eastern Turkey and east throughout the mountainous periphery of the Iranian Plateau.

AFGHANISTAN RECORDS: Scully (1887, p. 73), Aitchison (1889, p. 59), Niethammer (1965, p. 35; 1970, p. 21).

1965 Street Expedition: FMNH 103167-173.

AFGHANISTAN HABITAT: They are vertically distributed between 500 and 2,600 m. in mountains and adjacent steppes. Common in the structure biotope, particularly on fallow terraces; also found in the clay-and-loess biotope. They are conspicuously absent in South Afghanistan. A search extending more than 300 km. in Monsoonal Afghanistan and the Jalalabad Vale failed to reveal any of the characteristic mounds of earth which indicate the presence of this vole.

Taxonomic Notes and Discussion.—

Scully (1887, p. 73) described *Ellobius intermedius* from three specimens collected at Bokun and Kila Wali (Qala Wali 35°47'N, 63°44'E) in Herat Province. Ellerman and Morrison-Scott (1951) and Ognev (1950) erroneously give Herat as the type locality for this alleged species.

Scully (1887) used three characters to distinguish between *E. fuscocapillus* and his *E. intermedius*: the color of the base of the fur,

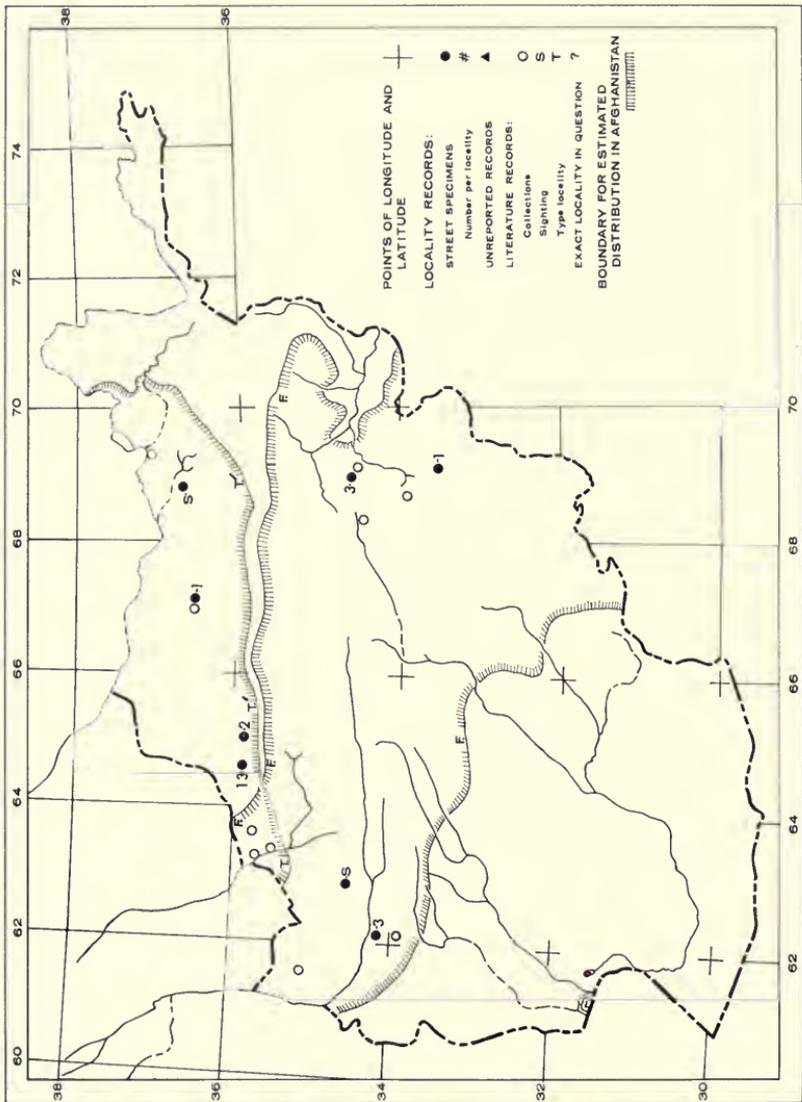


TABLE 9.—Body measurements of *Ellobius* from Afghanistan.

(Measurements in mm.)

Species	Records	Sample	Head and body	Tail	Hind foot
<i>E. fuscocapillus</i>	Scully (1887) ¹	3	114-127	10-12	20-23
	Aitchison (1889)	4	98-115(111)	12-16(14)	19.4-20.6(20.4)
	1965 Street Exp.	7	114-127(119)	8-16(11)	21-25(23)
<i>E. talpinus</i>	1965 Street Exp.	16	98-124(109)	6-10(8)	21-24(22)

¹ No mean given; original measurements are in inches.

the shape and structure of the zygoma, and the presence or absence of a posterior lobe behind the last outer angle of *M3*. Two years subsequent to Scully's description of *intermedius*, Aitchison (1889, p. 59) remarked: "The cranial and dental characters Scully gives, however, although at first sight they would prove to be of specific importance, prove to be so variable within the present series that I feel I must adhere to the above determination, [*E. fuscocapillus*] . . ." Ognev (1950, p. 609) is more to the point, noting: "For our part we are certain that *E. intermedius* Scully (from Herat) [sic] is a synonym of *E. fuscocapillus*; the analysis of features given by Scully proved fruitless, as none had any validity." In our seven specimens the variation of Scully's supposed taxonomic characters supports the quoted views of Aitchison and of Ognev.

Scully's specimens from Qala Vali, a village in the Murghab River drainage, represent the northeastern most record for *fuscocapillus*. Further north, but in this same drainage, Bobrinskii et al. (1965) illustrates U.S.S.R. distribution records for *E. talpinus*, and about 100 km. east of Qala Vali (in an abutting drainage) the Street Expedition collected 15 *E. talpinus*. The geographical proximity of these records, the relative continuity of suitable habitat, and the absence of geographical barriers suggests that the ranges of these species may meet or overlap in the environs of Qala Vali.

The overall appearance of the dorsal pelage of this species, unlike the duller, grayer looking pelage of *talpinus*, is Avellaneous to Pinkish Cinnamon. As shown in Table 9, its body dimensions are on the average larger than those of *talpinus*.

FIG. 15. The records and estimated limits of distribution for *Ellobius fuscocapillus* (F') and *Ellobius talpinus* (T'). Three records within the zone of distribution overlap are for *fuscocapillus*.

Field Notes and Discussion.—

The mole-vole is aptly named. Earth is ejected upon the surface from the mouths of lateral tunnels of usually shallow burrows, forming small mounds about 300 mm. wide and 100 mm. high; subsequently the lateral tunnel leading from the mound to the main passage is plugged with soil. During the course of our expedition we excavated approximately 150 such lateral tunnels, and succeeded in finding the open main passage in about 75 per cent of them.

I counted over 100 separate mounds of ejected earth on a 30 by 50 m. terrace between Kabul and Paghman in November. Approximately 10 per cent of these mounds were fresh, indicating recent digging. Although abundant where they were found, we noticed some peculiarities in their geographic distribution. Mounds were locally abundant near the eastern edge of collecting locality 9, but we saw nothing suggesting the presence of mole voles near the western end of this same locality. Two roads separated by a hill connect Paghman with Kabul. No *Ellobius* mounds were seen along the route which traverses the southwestern exposure, but I saw over 1,000 mounds on fallow terraces and earthen banks along the alternate route, which traverses the northeastern exposure of this hill.

Plugged burrows leading from fresh mounds were excavated with a spoon and small shovel on Sauzak Pass (Sept. 21) and near Herat (Sept. 16–20), Gardez (Oct. 8), and Paghman (Nov. 22–26). In most instances the plug ended within a third of a meter revealing the main burrow system. Mole voles were collected by so unplugging their burrow systems, hollowing out a chamber (150 mm. deep), placing a mouse trap baited with melon, onion, or stock bait in the chamber, making sure there was enough vertical space for the trap to operate properly, and, finally, excluding light and drafts from the excavation by placing a piece of cardboard covered with soil or a rock over the chamber. Approximately 50 trap nights equally distributed between the above localities yielded four specimens. Of the 46 remaining sets at least 35 were rendered useless with fresh earth delivered by a resident mole vole. This experience stimulated me to repeat the procedure but to place a mole trap at the entrance of each. Doubtless to replug the lateral tunnel, a vole pushed earth into the trigger of the trap and was caught. Using this method at dusk (near Paghman) I collected three specimens from ten traps within an hour.

We encountered what seems a difference in response from *E. talpinus*. Approximately 50 trap nights (near Mazar-i-Sharif, Sept.

6; and in Maimana, Sept. 8-14) using the chamber set yielded 16 individuals in this case, and only about 25 traps were covered with earth. These results, when compared with the above figures for a similar number of trap nights for *E. fuscocapillus*, suggest that the sampled segment of each species reacted differentially to the same stimulus. An environmental difference such as declining food resource could have facilitated the successful use of the chamber set in North Afghanistan. The mean air temperature recorded at camp was 20.5°C or above during the period when *talpinus* were collected and below 15.0°C when *fuscocapillus*, without exception, ignored the proffered bait. Perhaps lower temperatures stimulated *fuscocapillus* to re-establish environmental equilibrium by shoving earth into the chamber to close off the leak of humid and constant temperature air, and incidentally by shoving earth into the chamber to cover the trap and food.

***Ellobius talpinus* Pallas**

Northern Mole-Vole

Mus talpinus Pallas, 1770, Nov. Comm. Acad. Petrop., 14, 1, p. 568.

Type locality.—Kostytchi, west bank of River Volga, Russia.

Distribution.—

GENERAL: The southern Ukraine through southern Russia to Chinese Sinkiang and western Mongolia; reaching its southern limit of distribution in North Afghanistan.

AFGHANISTAN RECORDS: Niethammer (1965, p. 35; 1970, p. 8).

1965 Street Expedition; FMNH 103151-166.

AFGHANISTAN HABITAT: Found below 1,300 m. in the clay-and-loess and structure biotopes in North Afghanistan, it is common on fallow terraces and alluvial fans. Ognev (1950, pp. 584-590) summarizes the natural history of this species, indicating that it is found in a variety of habitats.

Discussion.—

Niethammer (1965, p. 35) comments: "Dr. Meyer-Oehme reported it in Afghanistan from remnants in pellets collected near Balkh." Subsequently, Niethammer (1970) collected four *talpinus* near the Amu Darya (river) north of Taliq-an. The first collections of whole specimens were made by the Street Expedition. A description of the method used to trap this species is given in the foregoing account on *E. fuscocapillus*.

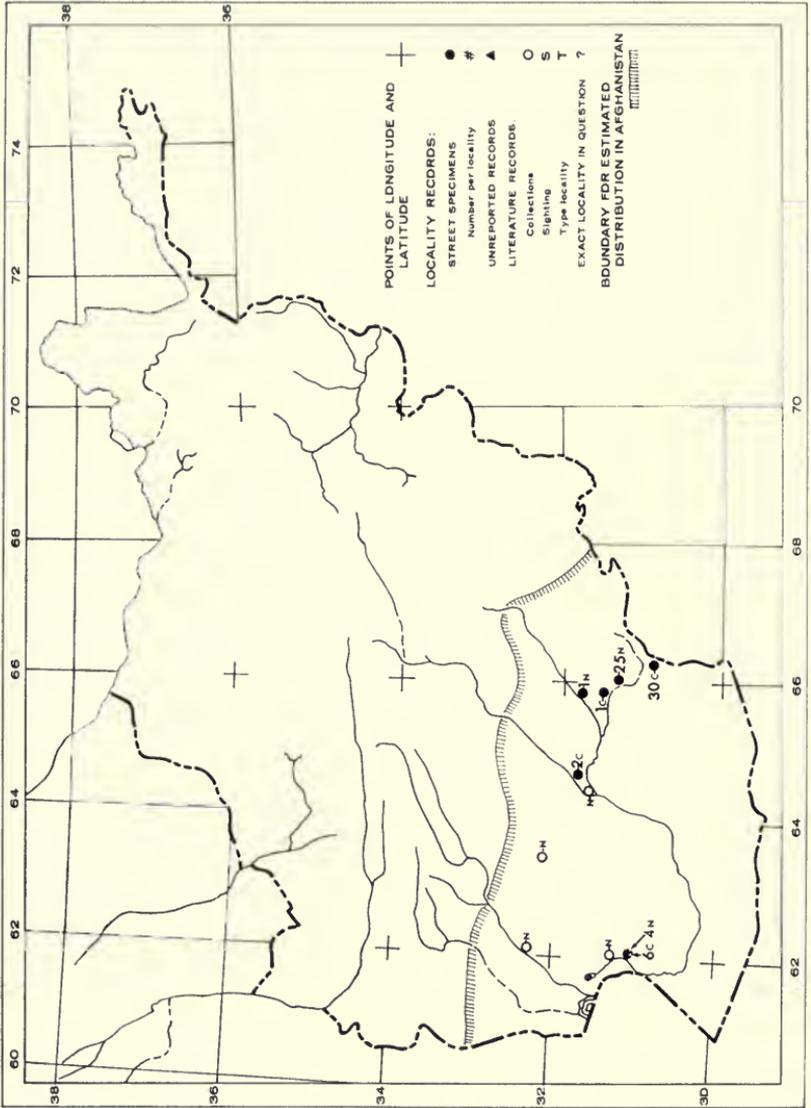


FIG. 16. Records and estimated limits of distribution for *Gerbillus cheesmani* (C) and *G. nanus* (N).

Gerbillus cheesmani Thomas

Cheesman's Gerbil

Gerbillus cheesmani Thomas, 1919, Jour. Bombay Nat. Hist. Soc., 26, p. 748.*Type locality*.—Iraq, near Basra.*Distribution*.—

GENERAL: Iraq, Arabia, Iran, and Afghanistan.

AFGHANISTAN RECORDS: 1965 Street Expedition: FMNH 103206-246, in alcohol 103226-35, skin only 103206, -07, -09, -10, -12-17, -19-22, -24, -25, -36.

AFGHANISTAN HABITAT: Found below 1,000 m. in the sand biotope in South Afghanistan. Vegetation: medium to high density, low shade, one or two strata, clumped distribution, low to high homogeneity.

Taxonomic Notes.—

The overall tone of the dorsal pelage is sandy orange. There is a small white spot above each eye and behind each ear. Flanks, belly, and feet (including the soles) covered with white hair. Tail similar to back, sometimes white ventrally, and dorsally tipped with Light Drab hairs.

The mean and extreme skull length for 11 skulls: 29.1-32.4 (31.3). This compares with 27.3-28.4 mm. for three *G. gleadowi* from the Sind, W. Pakistan as given by Siddiqi (1961, p. 216) for the occipitonasal length. The mean and extreme dimensions for nine topotypical *G. gleadowi* skins given by Murray (1886, p. 246) in his original description of this Oriental gerbil are: HB 82-89 (83.9); T 117-133 (126.8); HF 28-30 (29.3); and E 9-11 (10.5). Apparently, *cheesmani* from Afghanistan (table 10) is a larger species than the typical *gleadowi* from the Sind. Whether these two species can be maintained as such, on the basis of size alone, remains to be seen.

Field Notes.—

The most northwestern record for this species was made by Mr. Atallah about 5 km. due west of the Kandahar International Airport terminal.

This species was numerous in the sand dunes west of Spin Baldak. A census of active burrows revealed there were at least 100 animals per hectare in certain areas. In one such area we caught 30 specimens within two hours after dusk using 150 museum specials baited with our stock bait. Their burrows are from 40-60 mm. in diameter and usually located in sandy soil, often under a thorny shrub. They were easily trapped.

TABLE 10.—Body measurements of *Gerbillus* and *Tatera* from Afghanistan.

Species	Records	Sample	(Measurements in mm.)				
			Head and body	Tail	Hind foot	Ear	
<i>G. cheesmani</i>	1965 Street Exp.	41	70-112(97.3)	107-156(130.9)	30-37(32)	12-17(13)	
	Niethammer (1965)	5	84-94	110-122	22-23	10-12	
	1965 Street Exp.	32	62-86(79)	92-125(112)	21-26(24)	11-13(12)	
<i>T. indica</i>	Hutton (1845)	1	229	178	—	—	
	Niethammer (1965)	4	130-155	150-165	35-38	21-24	
	1965 Street Exp.	36	108-208(150)	105-183(149)	34-45(38)	20-27(24)	

This species has at least one activity peak, at dusk. On October 31 we were setting traps in low ridges of sand located along a wadi about 15 km. west of Spin Baldak near the Afghan-Pakistan border. There was an appreciable amount of daylight remaining when Dr. Lewis called my attention to a small gully (about 1 m. from where we stood) with shrubby clumps of *Haloxylon* obscuring about 50 per cent of the sandy substrate. For approximately 3 m. to the right and left of our vantage point we were able to count at least ten *G. cheesmani* retrieving seeds from near the tops of the shrubby *Haloxylon*, some plants a half meter high. The climbers appeared to be agile. Approaching to within a meter of one gerbil-adorned shrub sent them scurrying in all directions. At this point there appeared to be twice as many as I had counted before. In any event, at least ten gerbils were feeding within 2 sq. m.

***Gerbillus nanus* Blanford**

Baluchistan Gerbil

Gerbillus nanus Blanford, 1875, Ann. Mag. Nat. Hist., 16, p. 312.

Type locality.—Gedrosia, further specified as Baluchistan (W. Pakistan), Saman Dasht by Blanford (1876, p. 72).

Distribution.—

GENERAL: South of the Mediterranean from Algeria through parts of Arabia, Iran, Afghanistan, and Baluchistan eastward to the Punjab in northwest India.

AFGHANISTAN RECORDS: Niethammer (1965, p. 33).

1965 Street Expedition: FMNH 103174-205, in alcohol 103174, -78, -83, -84, skin only 103175, -76, -77, -79, -81, -85, -86, -87, -88, -90, -91, -93, -94. (see: *Discussion*).

AFGHANISTAN HABITAT: Typically found in the clay-and-loess, watercourse and structure biotopes, and to a lesser extent in the alluvial ecotone between the rock and clay-and-loess biotopes below 1,150 m. in South Afghanistan. We found their burrows in vegetation characteristic of the southern semideserts having a low to medium density, low shade, one stratum, a clumped distribution, and usually high homogeneity.

Discussion.—

This species was previously listed by Selater (1891, p. 51) as being collected from Gulistan in Afghanistan. J. A. Murray was cited as the collector. Murray (1887, pp. 50-69, 106-124) reports on the "Zoology of Beloochistan and Southern Afghanistan"; how-

ever, the specimens he lists from southern Afghanistan are, with few exceptions, from the deserts and mountains surrounding Quetta in W. Pakistan. Accordingly, Gulistan is north of Quetta, but not in Afghanistan.

Gerbillus was easily collected from mouse-size burrows using museum special snap traps baited with peanut butter. Three specimens were captured with the aid of a spotlight and net.

Tatera indica Hardwicke

Indian Gerbil

Dipus indicus Hardwicke, 1807, Trans. Linn. Soc. London, 8, p. 279.

Type locality.—United Provinces between Benares and Hardwar, India.

Distribution.—

GENERAL: Syria and northern Arabia through parts of Persia, Afghanistan, W. Pakistan, and India south to Ceylon.

AFGHANISTAN RECORDS: Hutton (1845, pp. 137–139), (According to Sclater, 1891, p. 48, J. A. Murray collected *Gerbillus indicus* = *Tatera indica* from Gulistan, Afghanistan, but as mentioned before, the “Gulistan” in question is in W. Pakistan.) Niethammer (1965, p. 33). Gaisler et al. (1967).

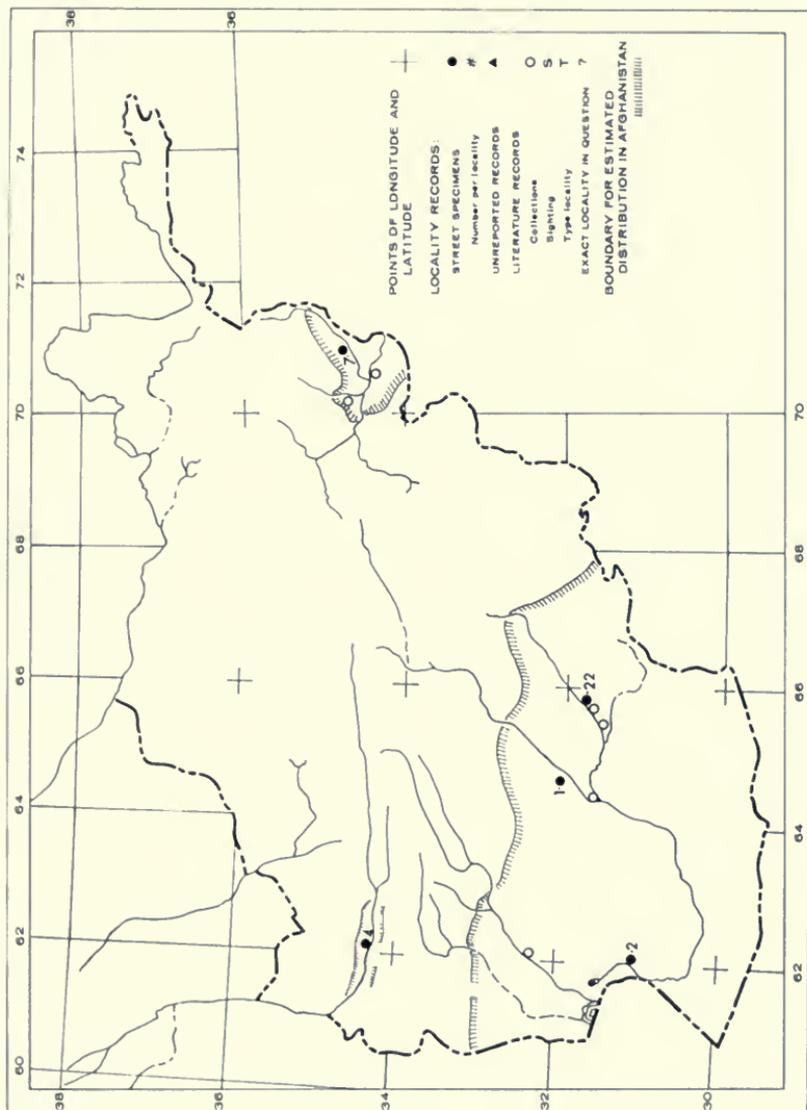
1965 Street Expedition: FMNH 103247, 103250-273, in alcohol 103252, -65, -80, -81, skin only 103272, -76, -77.

AFGHANISTAN HABITAT: This subtropical species reaches the northern limit of its distribution in Afghanistan. It was usually found below 1,000 m. in the clay-and-loess, water-course, and structure biotopes in the steppes and semi-deserts of dry Afghanistan. Vegetation was frequently characterized by high density and low homogeneity in the vicinity of their burrows.

Discussion.—

The northernmost record of this species is Herat where we purchased four specimens that had been captured in local bazaars near our camp. The fact that our traps set beyond the city of Herat in *Tatera* habitat failed to yield this species suggests that man may

FIG. 17. Records and estimated limits of distribution for *Tatera indica*. Four specimens caught within the city of Herat may be accidental introductants and as such may not reflect a continuous distribution this far north.



have facilitated their distribution this far north. In fact, Gaisler et al. (1967) calls *Tatera* a hemisynanthrope in Afghanistan, but he adds, it does not invade continuous human habitations. As shown in Figure 17 their distribution is disjunct in Afghanistan. Niethammer (1965, p. 33) remarks: "Its distribution in Afghanistan is the same as that of *Gerbillus nanus*." I found no evidence which would suggest *G. nanus* occurred as far north as Herat or in the Jalalabad Vale.

These nocturnal rodents were commonly found in colonies, occasionally in a single burrow. The highest density that we encountered, as shown by trapping records, burrows, and well-worn trails, was along the steep banks of irrigation ditches which supplied the pomegranate orchards of Kandahar with water. As one example, six rat traps set at 2 or 3 m. intervals along a well-worn trail at the base of a mud wall separating two pomegranate orchards caught five adult *Tatera*.

Meriones crassus Sundevall

Sundevall's Jird

Meriones crassus Sundevall, 1842, K. Sv. Vetensk. Akad. Handl., p. 233.

Type locality.—Sinai: Fons Moses (Ain Musa).

Distribution.—

GENERAL: Western Sahara to West Pakistan reaching its northern limit of distribution in Iran and Afghanistan (see comments below).

AFGHANISTAN RECORDS: Scully (1881, p. 228), Ellerman (1948, p. 797).

Niethammer (1966-67, *in litt.*, Kandahar, and owl pellets from Herat.)

1965 Street Expedition: FMNH 103285-326, in alcohol 103324, skin only 103285-289, -291-294, -296-299, -301, -302.

AFGHANISTAN HABITAT: Common below 1,500 m. in the clay-and-loess, and ephemeral watercourse (wadi) biotopes, and in the ecotone between the clay-and-loess and sand biotopes. Characteristic vegetation: low to medium density, low shade, one stratum, a clumped distribution and medium to high homogeneity.

Taxonomic Notes and Discussion.—

Scully (1881, p. 228) described *Gerbillus swinhoei* (= *M. crassus swinhoei*) from Gatai between Kandahar and Kojak Pass, about

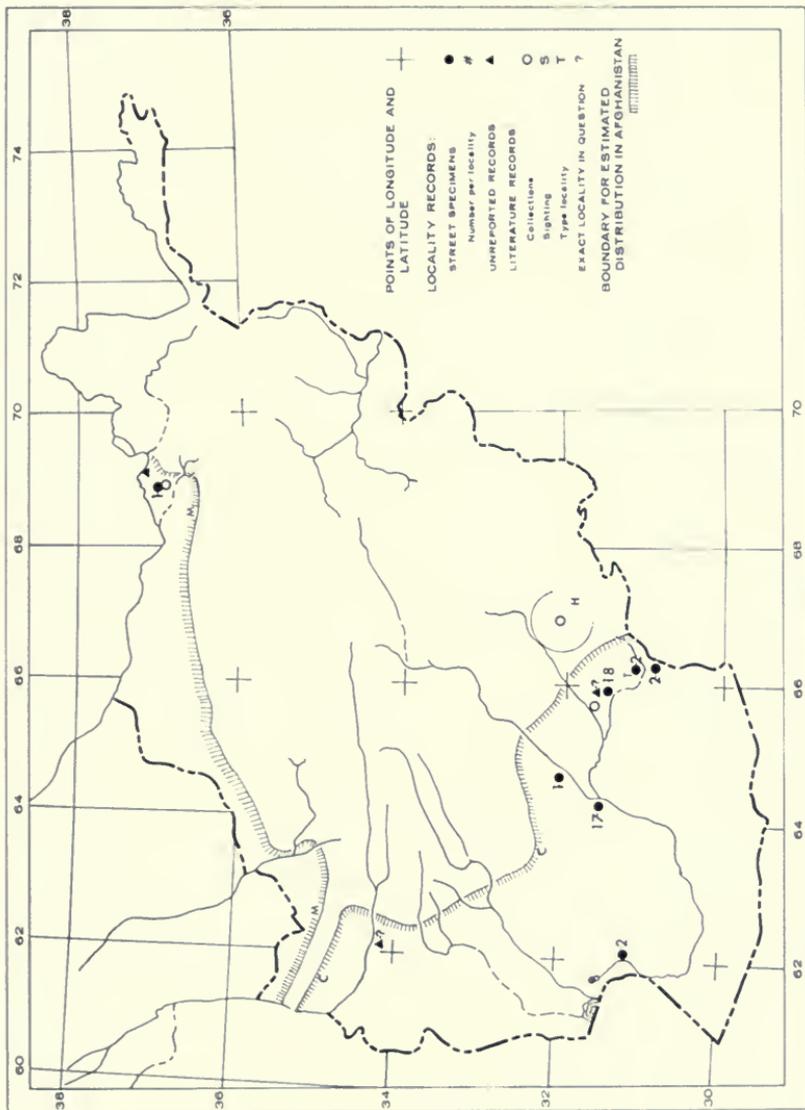


FIG. 18. Records and estimated limits of distribution for *Meriones crassus* (C) and *Meriones meridianus* (M). A single record for *M. hurrianae* (H) is circled.

10 miles (16 km.) north of the Afghan-Baluchistan border. He remarks: "The animal, though not very old, appears to be quite full-grown." Measurements of the type compared with 42 specimens of adult *crassus* (including 22 virtual topotypes) contradict Scully's estimation of full growth. None of our material is as small as the type. I was able to examine the type skull which, contrary to Ellerman (1948, p. 797), is unbroken. Its occipitonasal length is 30.1. The occipitonasal length for 10 skulls from Afghanistan ranges from 31.1–35.5. See also Table 11. The type for *M. crassus swinhoei* was described from a growing subadult.

Chaworth-Musters and Ellerman (1947, p. 487) and Ellerman and Morrison-Scott (1951, p. 647) make *M. zarudnyi* a subspecies of *M. crassus*, thus *M. crassus zarudnyi*. The recent comments by Lay (1967, p. 182) and the observations reported below in the species account of *M. zarudnyi* both support Heptner's (1937, pp. 189, 191) original assessment of the status of *M. zarudnyi*, that it is quite distinct from *M. crassus* and other species of *Meriones*. The inclusion, as by Ellerman and Morrison-Scott (1951, p. 647), of "extreme south Russian Turkestan," in the range of *M. crassus* is therefore no longer justified.

Field Notes and Discussion.—

When located, this species was easily trapped using museum special snap traps or rat traps, preferably the latter. Over 75 per cent of our catch was made between dusk and 10:00 P.M., although the traplines were run again after ten.

A small, roadside gully south of Kandahar had 100 burrow entrances in as many meters, which we recognized to be those of this species. Burrow orifices were often under thorny shrubs, although many were also found in areas devoid of vegetation. A wadi skirting a pebble desert southwest of Qala Bust contained burrows recognized as of this species, evenly distributed, about one per 15 sq. m. for 1 km.

Meriones hurrianae Jerdon

Indian Desert Gerbil

Gerbillus hurrianae Jerdon, 1867, Mamm. India.

Type locality.—India: Punjab: Hissar.

Distribution.—

GENERAL: Northwestern India and West Pakistan.

AFGHANISTAN RECORDS: Sclater (1891), Thomas (1919, p. 72).

TABLE 11.—Body measurements of *Meriones* and *Ictobomys opimus* from Afghanistan.
(Measurements in mm.)

Species	Records	Sample	Head and body	Tail	Hind foot	Ear
<i>M. crassus</i>	Scully (1881) ¹	1	86	79	24	11
	1965 Street Exp.	42	90-129(107)	82-106(93)	25-33(27)	13-17(14)
<i>M. libycus</i>	Gray (1842) ²	1	135	109	33	—
	Scully (1887)	1	137	—	33	15
	Zimmerman (1955)	19	111-138	111-140	30-34	15-19
	Niethammer (1965)	9	135-155	125-150	31-35	16-18
<i>M. meridianus</i>	1965 Street Exp.	132 ³	110-162(135)	111-158(130)	31-39(33)	13-21(17)
	1965 Street Exp.	1	136	114	29	15
<i>M. persicus</i>	Niethammer (1965)	10	140-160	140-175	36-40	21-24
	1965 Street Exp.	24 ⁴	132-163(146)	158-183(168)	37-41(39)	20-26(24)
<i>M. zarudnyi</i>	Heptner (1937) ¹	1	156.5	154.6	33.6	25.2
	1965 Street Exp.	2	139, 144	142, 168	34, 37	24, 27
<i>R. opimus</i>	Niethammer (1965)	3	165-180	160-170	39-40	10-13
	1965 Street Exp.	29 ³	151-196(169)	131-174(150)	40-47(43)	8-16(13)

¹ Type for *M. c. swinhoei* (BMNH 81.8.16.9); original in inches; hind foot does not include claw length.

² Type for *M. l. erythraurus* (BMNH 44.9.15.8); original in inches.

³ Adult.

⁴ Type for *M. zarudnyi*; hind foot does not include claw length

AFGHANISTAN HABITAT: Records from India and Baluchistan suggest the Indian Desert Gerbil will be found below 1,500 m. in the clay-and-loess and sand biotopes. According to Blanford (1888-1891, pp. 398, 399): "This gerbille abounds in sandy desert or semi-desert, and is particularly common in Sind and the Indian desert between the Indus and Rajputana, where its holes are found everywhere, especially at the roots of bushes amongst the sand-hills."

Discussion.—

Records of this gerbil from Afghanistan are questionable. Its existence in Afghanistan has not been verified by recent collections in its typical habitat.

Ellerman (1948, p. 794) gives the measurements of a specimen from Attok, Afghanistan. Niethammer (1965, pp. 36, 37) asserts that the occurrence of *hurrianae* in Afghanistan has not been proved in that: "I have not been able to find a place of this name [Attok] in Afghanistan. Possibly Attock on the Indus was meant, where *M. hurrianae* occurs."

I agree that the Attok in question is probably in W. Pakistan, however, there are two other records to contend with. According to Thomas (1919, pp. 726, 727), in his description of the subspecies *Cheliones hurrianae collinus* (= *M. hurrianae*), the type of this subspecies is from Kohat, N.W.F.P., W. Pakistan and other specimens are from: ". . . Attock, Khelat-i-Ghilzai, Afghanistan, and Baluchistan . . ."

Disregarding "Attock," the remaining locality Khelat-i-Ghilzai is between Ghazni and Kandahar in East Afghanistan. This is the only known locality from which *M. hurrianae* has been collected in Afghanistan. Slater (1891) reports on a specimen collected by Griffith in Afghanistan, but as usual Griffith failed to give an exact locality.

Other than the limited amount of suitable habitat transcending the elevation barrier imposed by the rim of the Iranian Plateau, there is no apparent reason why *M. hurrianae* will not eventually be "re-discovered" in Afghanistan.

Meriones libycus Lichtenstein

Meriones libycus Lichtenstein, 1823, Verz. Doubl. Mus. Berlin, 5.

Type locality.—Egypt: near Alexandria.

The following species previously recorded from Afghanistan is considered (according to Ellerman and Morrison-Scott, 1951) to be a subspecies of *M. libycus*.

Gerbillus erythrourus Gray, 1842, Ann. Mag. Nat. Hist., 10, p. 266.

Type locality.—Sahlabad, about 12 miles south-west of Kandahr.

Distribution.—

GENERAL: Western Sahara eastward across the Iranian Plateau and as far north as the Aral Sea and Lake Balkash in Russian Turkestan, and reaching the eastern limit of its distribution in Sinkiang, China.

AFGHANISTAN RECORDS: Gray (1842, p. 266); Hutton (1846, p. 139); Horsfield (1851, p. 15); Murray (1887, p. 121); Scully (1887, p. 71); Aitchison (1889, p. 59); Ellerman (1948, p. 796); Zimmerman (1955, p. 71); Niethammer (1965, p. 34); Gaisler et al. (1967).

1965 Street Expedition FMNH: 103249, -327-352, -354-396, -407-484, -511-515, in alcohol: 103343, -345-347, -350, -357, -358, -364, -371, -385, -392, -413, -414, -417, -422, -426, -428, -445-449, -452-455, -457, -460, -468, -476, skull only: 103395, -439, skin only: 103471, -476.

AFGHANISTAN HABITAT: Common below 2,000 m. throughout the steppes and semi-deserts of dry Afghanistan. It was collected in every biotope, the largest concentrations being found in the drier structure biotopes. Characteristic vegetation: medium-to-high density, low shade, one or two strata, clumped distribution and low to high homogeneity.

Taxonomic Notes and Discussion.—

Scully (1887, p. 71) describes a *Gerbillus* sp. from Balkh, North Afghanistan. From his description it could be concluded that this specimen is either *M. zarudnyi* or *M. libycus*, although he asserts: ". . . neither can it be referred to *G. erythrourus* [= *M. libycus erythrourus*] with which I have compared it." I have assigned this specimen to *libycus* rather than *zarudnyi* for the following reason. The measurements of the skin as given by Scully (see table 11) are similar to those of *libycus* rather than *zarudnyi*, the latter being slightly larger in all respects, but especially the ears which are at least 8 mm. longer. Even if Scully measured the ear at front from notch of orifice it would be approximately only 2 mm. longer, not eight. In fact

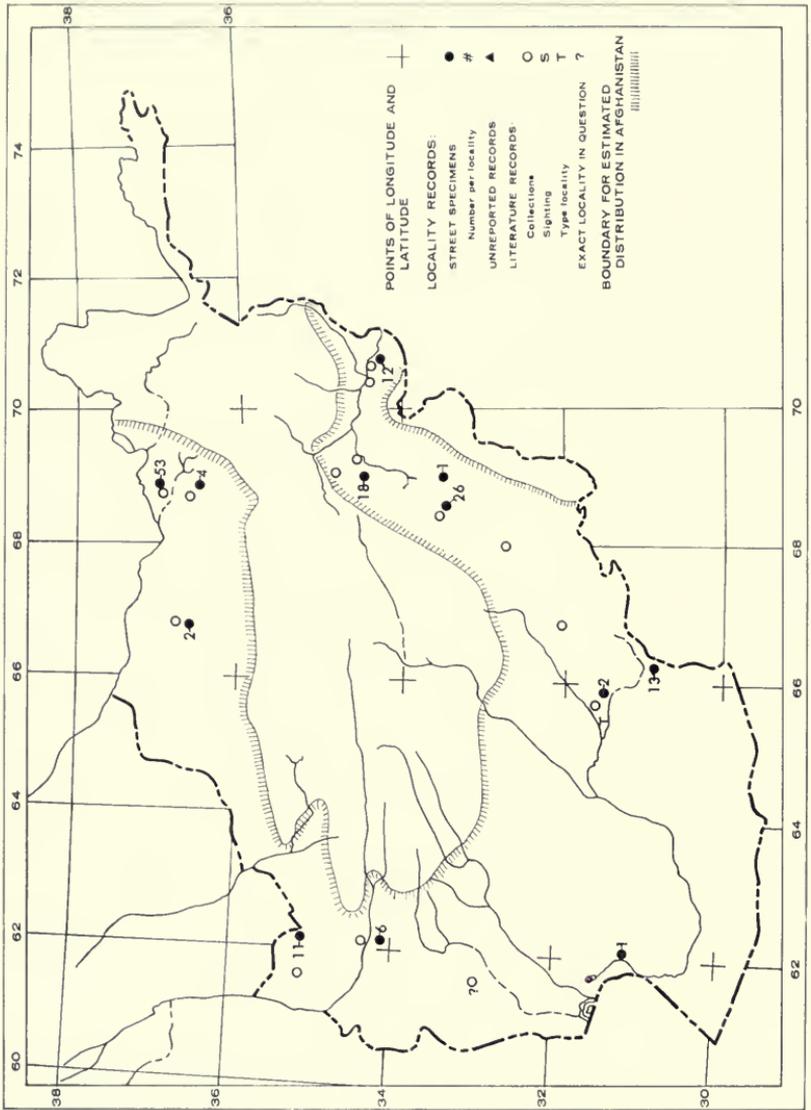


FIG. 19. Records and estimated limits of distribution for *Meriones libycus*.

if 2 mm. were added, Scully's *Gerbillus* sp. would be average for Afghan *libycus*.

For *libycus* the overall tone of the dorsal pelage ranges from slightly grizzled Cinnamon Buff to Tawny Olive, and in this sub-adults resemble adults. Tails are Pinkish Buff to Sayal Brown, frequent bicolor appearance depending on the intensity of black tipping of dorsal hairs. The distal third of the tail is dorsally covered with black hairs, of which those at the tail tip range from 15 to 30 mm. long. The color of the belly varies from light gray to white. Feet are covered with whitish or Pinkish Buff hair. Soles of hind feet have hair except for a naked strip extending from the heel along the medial side of the foot to slightly beyond the tarso-metatarsal joint. Molt had no obvious effect on the general tone of the dorsal pelage. About half of our specimens have one or more molt lines, appearing as gray or black crescents which may be irregularly distributed from the head to the base of the tail, according to the progress of the molt. Molting specimens were collected from July through November.

Field Notes and Discussion.—

A female taken July 13 had six embryos. Five of six specimens collected near Paghman in July were sub-adults. In October, a second collection from this locality yielded 11 adults and one sub-adult.

Populous colonies were often found to be associated with disruptions of the natural surface of the soil. For example, in a graveyard south of Kunduz each of more than 50 grave mounds had its complement of from one to four burrow openings. Few holes were seen between the grave mounds. In virtually every locality where we collected this jird on the steppe north of Kunduz burrows were concentrated around earthen ruins and along dry, unused irrigation ditches.

Near Ghazni in a large colony consisting of approximately 300 burrows unequally distributed over a square kilometer, a few burrows were excavated. This revealed that not all active burrows (well-worn with fresh tracks in the dust) were occupied. Vacant burrows consisted of two holes with a shallow tunnel between them. Piles of seed husks at the entrances of these holes indicate they might be used as a temporary refuge while feeding on seeds carried in their cheek pouches.

This rodent is active during the day and night. Since baiting rat traps with our stock bait and placing them in the entrances (depressions were frequently scooped-out to hold the trap) of bur-

rows before nightfall usually provided us with a significant sample within an hour after sundown, it appears that at least one peak of activity is at dusk.

Meriones meridianus Pallas

Middy Gerbil

Mus meridianus Pallas, 1773, Reise Russ. Reichs, 2, p. 702.

Type locality.—U.S.S.R.: Near Novo-Bogatinsk, Uralsk Region, Kazakstan.

Distribution.—

GENERAL: Centers of distribution occurring between 35° and 50° north latitude from the Northern Caucasus, throughout Russian Turkestan to Northern China reaching its northern and southern limits of distribution in Mongolia and Afghanistan respectively.

AFGHANISTAN RECORDS: Gaisler et al. (1967). Niethammer (1967, *in litt.*, bones in owl pellets from near Darkat on the Amu Darya).

1965 Street Expedition: FMNH 103353.

AFGHANISTAN HABITAT: Two males were taken at 500 m. in the clay-and-loess biotope on the steppe, 25 and 27 km. north of Kunduz. This species probably occurs in similar situations in North and Northwest Afghanistan.

Kuznetsov (in Bobrinski et al., 1965, p. 303) includes northern Afghanistan in the general distribution of this species. The above records substantiate this estimation.

Discussion.—

The following description was made on the specimen collected by the Street Expedition: The overall tone of the dorsal pelage is Pinkish to Cinnamon-Buff. The tail is Pinkish Buff, the terminal fourth slightly tufted, and dorsally tipped with black. The belly and paws are covered with white hair.

Occipitonasal length of skull, 31.5 mm.; greatest breadth across bullae, 17.3; least interorbital constriction, 5.5; length of upper molar tooth row, 4.3; length of palatine slits, 4.8 mm.

The above specimen, a mature male with descended testes, was captured within a large colony of *M. libycus*. It is a smaller species with a relatively shorter tail and hind feet than *libycus* (see table 11). However, the most distinctive character separating these species is

the sole of the hind foot which is fully furred in *meridianus* but has a naked medial strip extending from the tip of the calcaneus to slightly beyond the tarsometatarsal joint in *libycus*.

The Street specimen and 49 *M. libycus* were collected from the same site 27 km. north of Kunduz suggesting that either *meridianus* is trap shy, occurs in low numbers, or that our trapping-technique biased our catch in favor *libycus*. The male specimen reported by Gaisler et al. (1967) was shot while night hunting north of Kunduz.

Meriones persicus Blanford

Persian Jird

Gerbillus persicus Blanford, 1875, Ann. Mag. Nat. Hist., 16, p. 312.

Type locality.—Iran: Isfahan Province; Qohrud. See Lay (1967, p. 175).

Distribution.—

GENERAL: Eastern Turkey, southwestern Russian Turkestan, and throughout the Iranian Plateau, but not in the Caspian or Monsoonal Forests.

AFGHANISTAN RECORDS: Ellerman (1948, p. 793) notes: "*M. persicus* is found in Afghanistan, where Chaworth-Musters tells me he obtained a specimen."; Niethammer (1965, p. 35); Gaisler et al. (1967).

1965 Street Expedition FMNH 103397-406, -485-508, -516-527, in alcohol 103518, skin only 103521.

AFGHANISTAN HABITAT: Found between 700 and 2,500 m. in the mountains and foothills of dry Afghanistan, occurring in the rock and watercourse biotopes. Characteristic vegetation: low density, low shade, one stratum, a clumped distribution and low-to-high homogeneity.

Discussion.—

Subadult animals were caught from July through early November. Our catch during the month of July consisted of 17 subadults and six adults.

Approximately 50 burrows scattered for 200 m. along the base of a conglomerate cliff 5 km. west of Bamian yielded nine specimens before 9:00 P.M. Chunks of conglomerate furnished these jirds with shelter as did rocks in other areas. According to Niethammer (1965, p. 33), this species: ". . . is rarely seen, as it is nocturnal and solitary, in contrast to *M. libycus*, which lives in colonies." Within 4 km. of Kandahar I watched three jirds scurrying back and forth under a

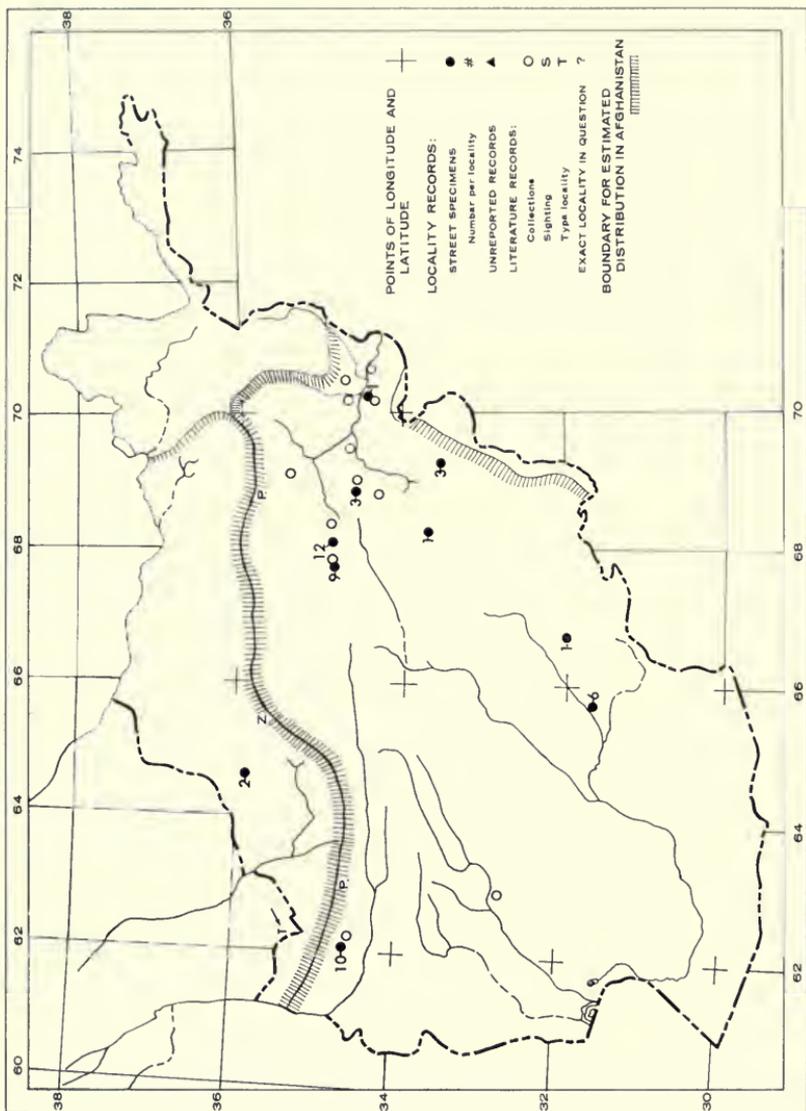


FIG. 20. Records and estimated limits of distribution for *Meriones persicus* (P) and *Meriones zarudnji* (Z).

flat, table-sized boulder at 4:00 P.M. in bright sunlight. When disturbed, they ran into rock crevices, but when they reappeared within 15 minutes they were collected.

Lay (1967, p. 177) observed "colonies" of *Meriones persicus*. I agree with Niethammer that this species is rarely seen, but our findings do not support Niethammer's observations that it is a solitary rodent or even wholly nocturnal. A more plausible reason for its being rarely seen is that it uses successfully the rocky cover typical of its habitat.

Meriones zarudnyi Hepner

Zarudny's Jird

Meriones zarudnyi Heptner, 1937, Bull. Soc. Nat. Moscou, Biol., 46, pp. 189, 191.

Type locality.—Kushka, along the Afghan frontier of Turkmen, S.S.R.

Distribution.—

GENERAL: This little known species has previously been collected only in southern Turkmen, S.S.R. A specimen reported by Heptner (1937, p. 191) from Lake Urmia, northwestern Iran, is, according to Lay (1970, *in litt.*), *M. tristrami*, thus Ellerman and Morrison-Scott's (1951, p. 647) inclusion of Iran in the range of *zarudnyi* is no longer warranted.

AFGHANISTAN RECORDS: 1965 Street Expedition: FMNH 103509, -510.

AFGHANISTAN HABITAT: We collected our two specimens at approximately 900 m. from a roadside threshing platform 11 km. north of Maimana, and from the ruins of an old building along the southern edge of the Maimana Oasis (see Hassinger, 1968, fig. 19). The nearby vegetation was of medium density, low shade, one stratum, clumped distribution, and low-to-high homogeneity.

Taxonomic Notes and Discussion.—

This species is earlier known from two specimens, which were reported upon by Heptner (1937, pp. 191, 192) in his type description of *zarudnyi*, when he found them in the Zoological Institute of the Academy of Sciences (Leningrad) and in the Zoological Museum of the Moscow University. A third specimen reported from Iran by Heptner (*op cit.*) is in fact *M. tristrami* (Lay, 1970, *in litt.*). Subsequently, Heptner (1958, pp. 141–147) reports 43 specimens from the Karabil Desert, WNW of Maimana, but in Turkomen, S.S.R.

Ellerman and Morrison-Scott (1951, p. 647) make *M. zarudnyi* a subspecies of *M. crassus* without having seen any specimens of *M. zarudnyi*. *Meriones crassus* is a smaller species, quite distinct from *zarudnyi*. Lay (1967, p. 182) gives the mean and extremes of the greatest length of the 24 largest skulls of a series of 41 *M. crassus* from Iran as 35.2 (29.5–38.3). The greatest cranium length given by Heptner (1937, p. 192) for the type specimen *zarudnyi* is 41.8 mm. or 3.5 mm. longer than the largest *crassus* skull. Skull measurements for the type (*vide* Heptner, 1937), FMNH 103509, and FMNH 103510 are, respectively: greatest cranium length, 41.8, 38.9, 43.9; condylobasal length, 34.4, 31.8, 36.8; zygomatic breadth, 22.8, 21.0, 22.7; bullar length, 16.4, 13.6, 16.3; and bullar breadth, 11.1, 10.6, 11.2. The largest dimensions of 42 *M. crassus* skins from South Afghanistan (see table 11) are, for each character, considerably smaller than the smallest figures given for *zarudnyi*. Thus, none of a series of 83 *M. crassus* from the Iranian Plateau is as large as the smallest *M. zarudnyi*.

In addition to difference in size these allopatric species (c.f. fig. 18, fig. 20) have structurally different bullae. In the type description, Heptner (1937, pp. 191, 192) concludes that the systematic position of *M. zarudnyi* is closer to jirds that have no inflation on the bullae anterior to the meatus, e.g., the species *M. tristrami* and *persicus*, than to species with this area inflated, e.g., *M. crassus*.

In the two specimens from Afghanistan *zarudnyi* superficially resembles *M. persicus* more than any other species of *Meriones*. These two are, however, readily distinguishable by *zarudnyi* having a haired sole except for a naked strip which extends from the calcaneum to the middle of the metatarsal region, while *persicus* has a completely naked sole. In the auditory bullae *M. zarudnyi* has a membrane superior to the manubrium and tympanum, which is replaced by bone in *persicus*; so that when one looks into the external auditory meatus, the malleus and incus are visible in *zarudnyi* but hidden medially to a bony partition in *persicus*. *M. zarudnyi* is regarded as a distinct species because of these differences of the sole and the ear bones.

Field Notes and Discussion.—

At each of two threshing platforms, which were literally riddled with burrows, placing more than 60 traps yielded a single *M. zarudnyi*. Among the ruins illustrated in Figure 19 by Hassinger (1968), we trapped a second *zarudnyi* in a colony of *Rhombomys*

opimus. Traps were placed prior to dusk and retrieved before 11:00 P.M. Since both specimens were taken before nightfall, leaving our traps set during the day might have increased our catch.

Rhombomys opimus Lichtenstein

Great Jird

Meriones opimus Lichtenstein, 1823, Eversmann. Reise Buchara, 122.

Type locality.—Kazakstan SSR: Aral-Kara Kum (see Bobrinski et al., 1965, p. 306).

Distribution.—

GENERAL: Below 48° latitude in Russian Turkestan from the Caspian Sea to the western border of Mongolia, reaching its southern limits of distribution in Baluchistan and Sinkiang.

AFGHANISTAN RECORDS: Eliseev and Kellina (1963, pp. 728–735), Niethammer (1965, p. 34).

1965 Street Expedition FMNH 103528, 530–565, in alcohol 103540, -546–549, -561.

Meinertzhagen, 1937, (Kunduz, FMNH 48480); Third Danish Expedition 1948–1949 (Miana Bam).

AFGHANISTAN HABITAT: Numerous below 900 m. in the clay-and-loess, structure, and watercourse biotopes in North and Northwest Afghanistan. Probably scattered along Afghanistan's western and southern border (see Lay et al., 1970).

According to Eliseev and Kellina (1963, pp. 728–735): "These rodents are the most numerous in the premountainous regions, where the (southern) border of the distribution coincides with a band of loess deposits, passing along the whole of northern Afghanistan at 400–800 m. above sea level. To the north of the premountainous areas in the Bactrian Plain, *R. opimus* is distributed in the sands and oases where they inhabit the embankments along irrigation canals, ruins and cemeteries."

Characteristic vegetation: medium-to-high density, low shade, one stratum, irregular distribution, and usually a medium-to-high homogeneity.

Discussion.—

Rhombomys opimus is diurnal with at least one peak of activity at dusk. They were easily shot during the day and trapped at dusk, but not seen abroad at night.

Huge colonies, frequently imparting a sieve-like appearance to the loess slopes along our route, were common. The largest such

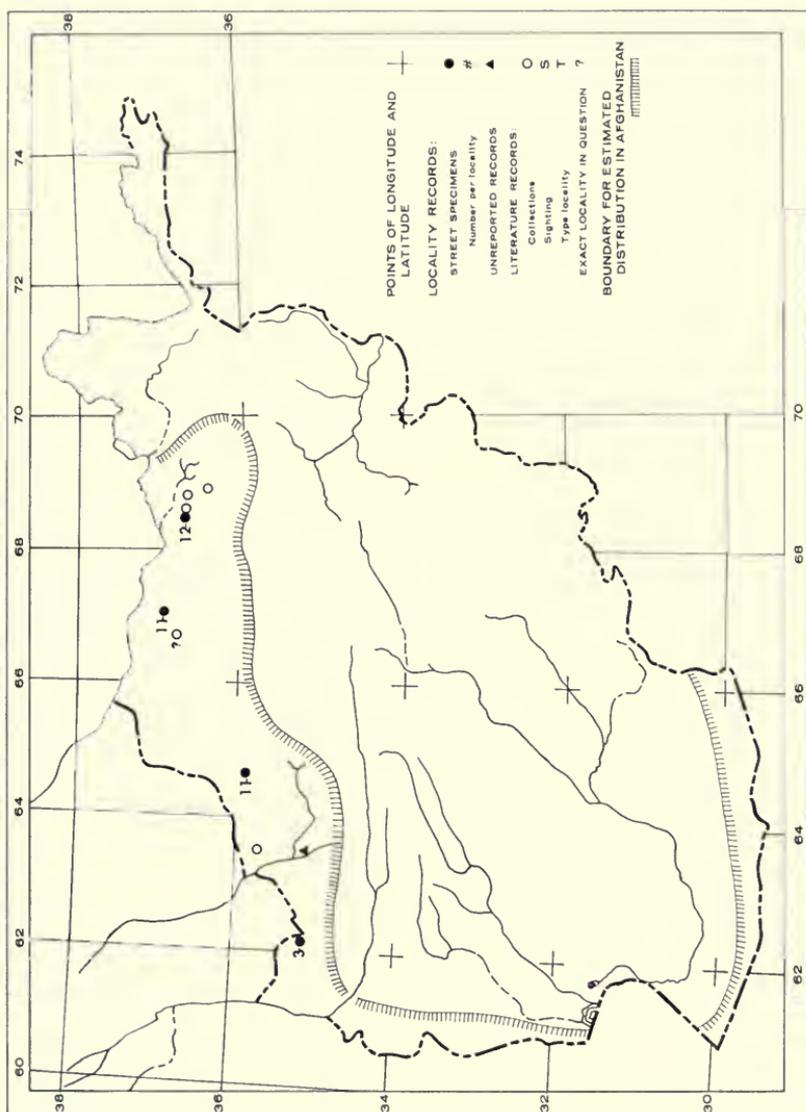


FIG. 21. Records and estimated limits of distribution for *Rhombomys opimus*.

colony I noted covered an entire hillside for approximately 5 km. This south-east facing, 25–40° slope (situated between Bala Murghab and Sauzak Pass) was conservatively estimated to be 200 m. from top to bottom. A photograph of a 150 m² sample plot showed at least 100 burrow orifices suggesting the hill was riddled with over 6,000 holes. This is not meant to imply each hole or set of holes was used or occupied. In another locality (20 km. west of Kunduz) investigation of this revealed that only 50–75 per cent of the holes of a roadside colony showed evidence of being used, the remaining burrows being caved in or partially filled with debris.

No piling (stores) of vegetation was seen, although loose twigs (species of Chenopodiaceae) and grass stems were often found at burrow entrances as if dropped after the leaves had been eaten off. A specimen taken near Kunduz had a mouth full of a legume. Inter-colonial vegetation having a lower density than extracolony vegetation suggests that these herbivorous rodents are capable of overgrazing local areas. For example, the loess bank of a large erosion gully 16 km. south of Mazar-i-Sharif had vegetation with a low density within a colony of approximately 100 burrow openings scattered over 200 sq. m. Beyond this colony vegetation had a medium to high density.

A female collected on the September 10 had four embryos.

Apodemus sylvaticus Linnaeus

Wood or Field Mouse

Mus sylvaticus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 62.

Type locality.—Sweden: Upsala.

Distribution.—

GENERAL: Throughout Eurasia from the British Isles to Japan, and from Morocco through Iran and northern Afghanistan to northern Burma.

AFGHANISTAN RECORDS: Blanford (1881, p. 162), Zimmerman 1955, p. 191), Niethammer (1965, p. 28; 1969, pp. 121–128).

1965 Street Expedition: FMNH 103566-601, in alcohol 103575, -76, -77, -84, -85.

1939 Chaworth-Musters Expedition (Paghman, Shibar Pass), Third Danish Expedition, 1948–1949 (Wama, Pashki).

AFGHANISTAN HABITAT: Found between 2,000 and 3,000 m. in wet and dry montane biotopes, with vegetation characterized by high density, or at least high shade. All of our 36 specimens

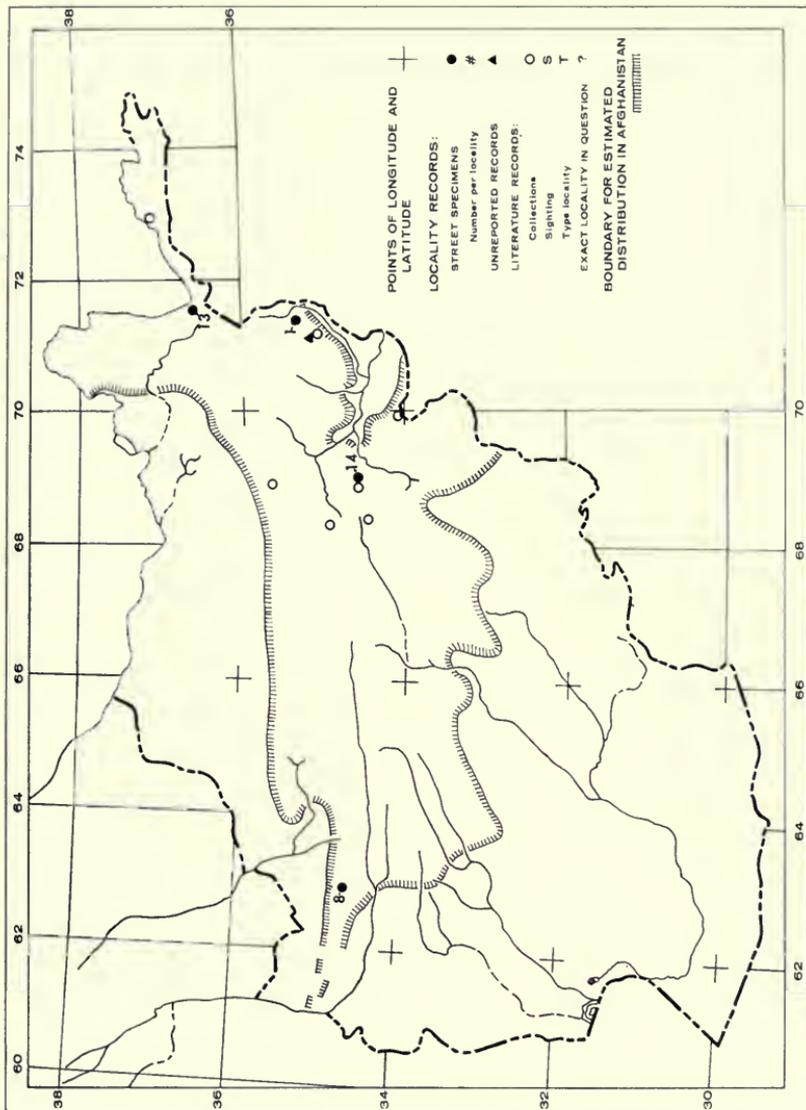


FIG. 22. Records and estimated limits of distribution for *Apodemus sylvaticus*.

were trapped from under or near rocks; 25 of them were living or foraging around rock walls or fences.

Taxonomic Notes and Discussion.—

Ellerman (1948, p. 815) gives the mean occipitonasal length for five of Chaworth-Muster's specimens (four from Paghman) as 27.0 mm. and tentatively refers these mice to *Apodemus flavicollis*. He distinguishes *A. flavicollis* from *sylvaticus* on the basis of mean occipitonasal length, which for the latter is given as averaging less than 27 mm. for each race.

Zimmerman (1955, p. 191) gives the extreme occipitonasal lengths for four specimens collected from the Salang Pass as 24.5 and 26.4 mm. He classifies these mice as *Apodemus sylvaticus arianus* and suggests the *Apodemus* collected by Chaworth-Musters are a'so *sylvaticus*.

Niethammer (1965, p. 28)—upon examining the specimens collected by Musters plus at least 20 others, including a series of 15 from Paghman—supports Zimmerman, concluding: "Ellerman (1948) identified it [*sylvaticus*] erroneously as *flavicollis*, a related species from which it is not easily distinguished."

We obtained a series of 14 *Apodemus* from Paghman. The mean and extreme occipitonasal lengths of five adults is 26.1 mm. (25.4–26.8). If we agree with Ellerman's key-separation of *flavicollis* and *sylvaticus*, this race must be referred to *A. sylvaticus*, hence my observations are in agreement with those of Zimmerman and Niethammer. (See also table 12.)

A series of 13 from the Wakhan Region and eight from Sauzak Pass resemble our Paghman series in virtually every respect of dimensions and pelage. Everything considered, the existence of two sympatric species of *Apodemus* has not been demonstrated for Afghanistan.

Field Notes and Discussion.—

Pregnant females, one with five and another with six embryos, were acquired on July 17 and August 18, respectively.

Approximately 300 trap nights each in "typical" *Apodemus* habitat—as indicated by our own results—failed to yield a single specimen near Ghazni, Gardez, Shibar Pass, or in the low, rocky mountains south of Mazar-i-Sharif and east of Maimana. Approximately 200 trap nights in Nuristan yielded nothing but *Mus* at 1,300 m. in the evergreen oak biotope, but higher, around 2,100 m.,

TABLE 12.—Body measurements of Muridae and Gliridae from Afghanistan.

Species	Record	Sample	(Measurements in mm.)				
			Head and body	Tail	Hind foot	Ear	
<i>A. sylvaticus</i>	Ellerman (1948)	5	95-102(98)	88-102(94)	21-20(21)	15-17(16)	
	Niethammer (1965)	20	90-106	84-105	20.5-23.0	14-17	
	1965 Street Exp.	36	80-111(95.1)	73-110(90.4)	20-24(22.2)	14-18(15.9)	
<i>R. rattoides</i>	Niethammer (1965)	30	170-200	160-180	32-35	20-23	
	1965 Street Exp.	36 ¹	145-211(175)	145-206(169)	31-39(35)	21-27(23)	
<i>R. rattus</i>	3rd Danish Exp.	3	160,160,175	184,190,200	—	—	
	1965 Street Exp.	3	130,161,166	125,176,187	29,33,31	20,22,22	
<i>M. musculus</i>	Niethammer (1965)	30	77-105	67-95	16-20	11-13	
	1965 Street Exp.	31	80-109(88)	64-101(80.1)	17-21(18.8)	13-15(14)	
		11 ²	80-98(89.3)	76-87(81.8)	15-20(18.3)	13-15(14.4)	
<i>N. indica</i>	Blyth (1846) ³	1	152	101	44	19	
	Niethammer (1965)	6	160-185	103-130	32-35	15-18	
	1965 Street Exp.	8 ²	137-191(172)	101-118(110)	32-37(34)	16-19(18)	
		35	145-283(178)	94-155(112)	31-43(35)	16-22(18)	
<i>D. nitedula</i>	Niethammer (1965)	1	90	88	22	13	
	1965 Street Exp.	6	101-113(108)	73-99(89)	21-24(23)	13-16(15)	

¹ Adults with a total length of 300 mm. or more.

² Eleven topotypes of *M. musculus bactrianus* or eight topotypes of *N. indica huttoni*.

³ Measurements of the type of *N. indica huttoni*.

in the coniferous biotope 30 trap nights produced an *Apodemus*. As Niethammer (1965, p. 28) writes: "*A. sylvaticus* reaches the southern limit of its distribution in Afghanistan and is therefore restricted to higher mountain regions." This may also explain our finding in various places an absence or scarcity of this otherwise prolific mammal in its typical habitat.

Where *Mus* and *Apodemus* occurred together the latter was never taken as close to human habitations as the former. *Apodemus* were lured with our stock bait or, in two instances, with tainted meat.

Rattus rattoides Hodgson

Turkestan Rat

Mus rattoides Hodgson, 1845, Ann. Mag. Nat. Hist., 15, p. 267.

Type locality.—Nepal.

Distribution.—

GENERAL: The Himalayan Mountains and west to the Hari Rud (River) in Afghanistan and south Russian Turkestan. The eastern extent of range for this species is uncertain.

AFGHANISTAN RECORDS: Zimmerman (1955, p. 190), Niethammer (1965, pp. 28, 29), Gaisler et al. (1967).

1965 Street Expedition: FMNH 103602-663, in alcohol 103627, -28, -47, skull only 103605, -52.

Meinertzhagen, 1937 (Doab, FMNH 48481). 1939 Chaworth-Musters Expedition (Paghman).

Third Danish Expedition, 1948-1949 (Gusalek, Pashki).

AFGHANISTAN HABITAT: This semicommercial rat was collected between 600 and 2,500 m. in the evergreen oak, coniferous, rock, watercourse, and structure biotopes. They were numerous in the structure biotope especially around small grist mills made of stone and situated near a perennial source of water. Near Herat they were collected from holes penetrating between the roots of stumps and trees.

Discussion.—

Zimmerman (1955, p. 190) identifies specimens collected by Klapperich near Paghman, in Kabul, and on the southern slope of Salang Pass as *Rattus rattus*. Niethammer (1965, pp. 36, 37) comments, "The house rats . . . were identified by Zimmerman as *R. rattus* without thinking of *R. rattoides*, as he wrote later." Altogether 47 specimens of *R. rattoides*, but no *R. rattus*, have been col-

lected from Kabul and Paghman by the Institute of Zoology in Kabul (Niethammer) and the Street Expedition.

The tail length for adults averages 103 per cent of the head and body length (table 12). The tail is bicolor, the ventral side being cream or white like the ventral pelage of this species. From two to ten of the mystacial vibrissae are all white. These characters distinguish this species from the commensal *Rattus rattus*, found in the Jalalabad Vale and certain monsoonal areas.

The dimensions and pelage of our specimens approximates those of the subspecies: *R. r. turkestanicus* Satunin, 1903, Ann. Mus. St. Petersb., 7, p. 588. The type locality is Assambob, Ferghana, Russian Turkestan, about 500 km. north of Ishkamish, Afghanistan.

Specimens from the coniferous biotope in Monsoonal Afghanistan are virtually identical to those collected in the watercourse and structure biotopes along the Hari Rud south of Herat.

Rats of this species having a total length of less than 300 mm. are here classified as growing animals or subadults. Approximately 32 percent of our July catch consisted of subadults compared with 50 percent for August, September, and October. Two females taken July 18 bore seven and nine embryos; a third collected July 29 held three embryos.

Nothing smaller than the Victor Holdfast rat trap should be used to catch this species. Two large specimens were caught in no. 1½ steel traps, which were baited with meat and set for carnivores.

***Rattus rattus* Linnaeus**

House Rat or Black Rat

Mus rattus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 61.

Type locality.—Sweden.

Distribution.—

GENERAL: Cosmopolitan, concentrated in anthropogenic habitat.

AFGHANISTAN RECORDS: Gaisler et al. (1967).

1965 Street Expedition: FMNH 103664, -65 and -66.

FIG. 23. Records and limits of distribution for *Rattus rattoides* (T) and *Rattus rattus* (B). Boundary B also circumscribes the only region in Afghanistan where these species share a common distribution; herein: an arrow points to the environs of Gusalek where both species were collected; dotted circles denote records for *rattoides*; remaining six records are, of course, for *rattus*.

Third Danish Expedition, 1948–1949 (Gusalek, Wama).

AFGHANISTAN HABITAT: This synanthropic mammal is known from below 1,600 m. in the structure biotope in the Jalalabad Vale, Gusalek, and Wama.

Discussion.—

Rattus rattus from Afghanistan differ from *R. rattoides* in having monochrome tails averaging 88 per cent of total length for five adults, further, their ventral pelage is gray and they have no white mystacial vibrissae. I could find no osteological characteristics which could be used to separate *rattus* consistently from *rattooides* with skulls of similar size.

Our Afghan driver-interpreter supplied shopkeepers in the Jalalabad bazaar with traps. He obtained our only three *rattus* in this manner.

Gaisler et al. (1967) collected 54 males and 66 females (February to April, 1966 and 1967) in the Jalalabad Vale.

The Afghan distribution of these rats suggests that this commensal arrived in Jalalabad from W. Pakistan. Jalalabad is the first major city where trucks coming from W. Pakistan stop.

R. rattus and *R. rattoides* co-exist in and/or near Gusalek in the Pech valley. A study of population interactions and habitat preferences in this locality might yield knowledge of importance to epidemiological problems in areas within the range of *R. rattoides*. For a small beginning in that direction, according to Gaisler et al. (1967), Paludan (*in litt.*) and our results, *R. rattus* has always been trapped in or near buildings and in the Jalalabad Vale and Pech valley, and *R. rattoides* is usually found away from buildings. But beyond these areas where the distribution of *R. rattus* has not been proven, *R. rattoides* replaces *rattus* as a habitant of buildings and other man-made structures.

Traps given to shop keepers in the Ghazni and Kandahar bazaars were returned empty; however, five bludgeoned *R. rattoides* were seen in Ghazni. Hutton (1846, p. 140) notes: “. . . the house rat is I believe unknown there [Kandahar]; at least so all my informants agree in stating, and I certainly never saw one, although for two years I was in charge of extensive grain godowns [storage units], which would naturally have attracted them had any existed.”

Mus musculus Linnaeus

House Mouse

Mus musculus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 62.

Type locality.—Sweden: Upsala.

Distribution.—

GENERAL: Worldwide.

AFGHANISTAN RECORDS: Blyth (1846, p. 140), Scully (1881, p. 228; 1887, p. 72), Zimmerman (1955, pp. 190, 191), Niethammer (1965, p. 31), Gaisler, et al. (1967).

1965 Street Expedition: FMNH 103060, 103667-99, 103701-33; in alcohol 103673, -74, -75, -77, -81, -90; skin only 103713-24, 103733; skull only 103676.

NOTE: The numerous locality records for this ubiquitous species are not plotted on a distribution map.

1939 Chaworth-Musters Expedition (Shibar Pass, Paghman, Ghazni). Third Danish Expedition, 1948-1949 (Kabul, Gusaklek, Wama, Pashki, Bagrabad, Bamian).

AFGHANISTAN HABITAT: This cosmopolitan commensal of man is found below 3,000 m. throughout the mountains and plains of the Iranian Plateau, concentrated in anthropogenic habitat.

Discussion.—

Mus musculus bactrianus was collected by Hutton and described by Blyth (in Hutton, 1846, p. 140) from Kandahar, Afghanistan. This subspecies is based upon a lectotype (B.M. 56.2.29.4) lodged in the British Museum of Natural History. There is no record of the dimensions of the fresh specimen, but I was able to make the following measurements of the intact skull: occipitonasal length, 21.8 mm.; zygomatic width, 11.4; interorbital width, 3.21; palatal length, 9.9; and post-palatal length, 7.8. Eleven adult topotypes were collected. Their body measurements are entered separately in Table 12.

Niethammer (1965) observed: "In Afghanistan, the color of the back varies considerably according to the humidity: light—nearly sand colored—animals occur in Seistan, specimens from Kabul are darker, and the darkest are from Nuristan." Our house mice are not unlike the series just described excepting that lightest—virtually sand colored—series was collected near Mazar-i-Sharif. Furthermore, two specimens taken 12 km. west of the Shibar Pass were as dark as our darkest specimens from Nuristan.

No consistent difference in the overall tone of the dorsal pelage, similar to the ones suggested by Lay (1967, p. 188) for certain *Mus* from Iran, could be found between free-living and commensal forms of *Mus* in Afghanistan.

We had no trouble collecting large series of this rodent wherever we went. It was the commonest species brought into our camp by Afghans. Traps distributed to the villagers were usually returned with *Mus*.

I caught them in low tree holes, along streams, among rocks and immediately below the coniferous biotope in Nuristan, but they were most numerous in the structure biotope. In some local area we found them in almost plague proportions. In Nuristan we took more than 100 in fewer trap-nights in the loose rock walls supporting terraces sown with corn. Forty trap nights in dryer, non-cultivated hills, less than 100 m. away from these terraces produced but one *Mus musculus*. Niethammer notes, "With increasing altitude, they live in closer contact with man." He mentions, for example, that near Kabul house mice were not taken in cultivated areas far from human habitation. We caught at least four *Mus* above 2,300 m., living from 1-4 km. from the nearest building, but our trapping records neither support nor refute Niethammer's observation. There is no doubt that house mouse populations are concentrated in the structure biotope, but this phenomenon is also common at the lowest elevations.

Nesokia indica Gray and Hardwicke

Bandicoot Rat

Arricola indica Gray and Hardwicke, 1832, *Illustr. Ind. Zool.*, 1, pl. xi.

Type locality.—India.

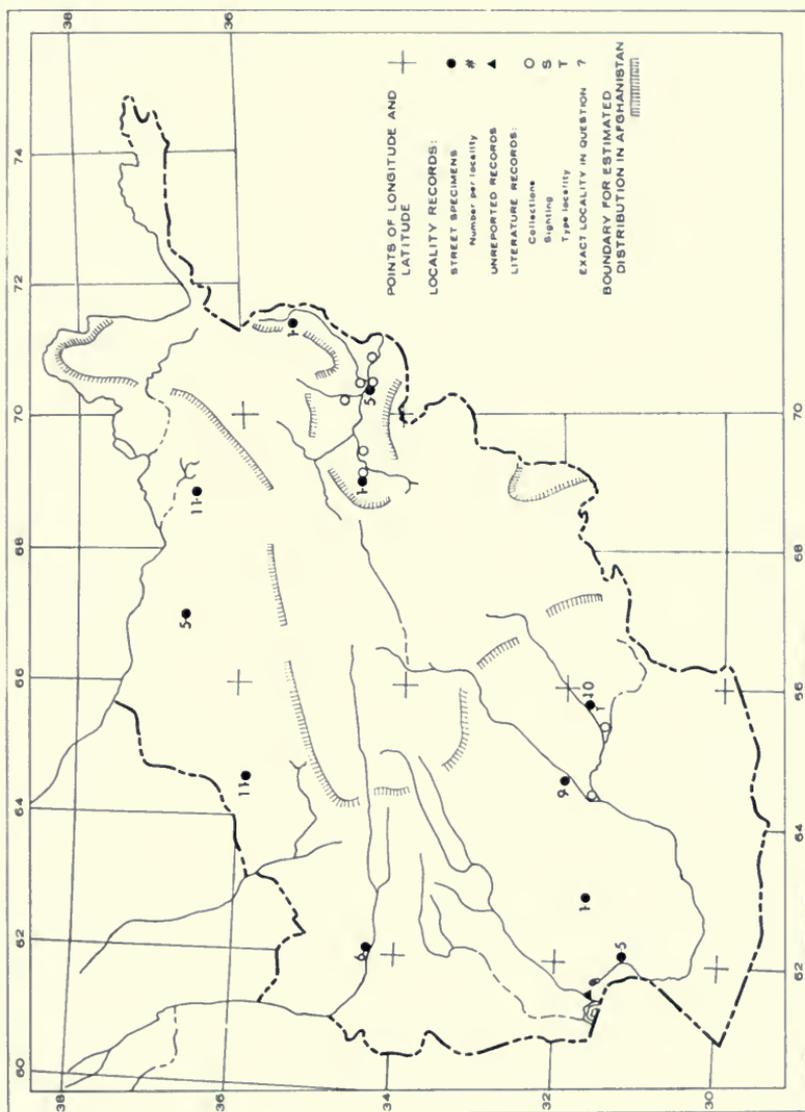
Mus huttoni Blyth, 1846, *Jour. Asiat. Soc. Bengal*, 15, p. 139.

Type locality.—Kandahar, Afghanistan.

Distribution.—

GENERAL: Egypt and Syria eastwards across Iraq, Iran, Afghanistan, and adjacent U.S.S.R. to Sinkiang, and West Pakistan, Rajasthan, and Punjab (modified from Ellerman and Morrison-Scott, 1951, p. 619). Abundant on the Iranian Plateau.

FIG. 24. Locality records and provisional (hence discontinuous) limits of distribution for *Nesokia indica*. Additional surveys (below 2,000 m.) are required along internal watercourses.



AFGHANISTAN RECORDS: Blyth (1846, p. 139), Zimmerman (1955, p. 191), Niethammer (1965, pp. 31, 32), and Gaisler et al. (1967).

1965 Street Expedition, FMNH 103734-74, 103776-99; in alcohol 103742-48; skins only 103776, -79, -82; skull only 103757.

1939 Chaworth-Musters Expedition (Kabul); Third Danish Expedition, 1948-1949 (Bagrabad).

AFGHANISTAN HABITAT: Found below 2,000 m. elevation in the watercourse and structure biotopes. Although this species abounds on cultivated terraces and in the banks of irrigation ditches, we collected a single specimen from a sandy ridge in the Khash River Valley where there was no free water within 300 m., nor any evidence of irrigation, and the surrounding vegetation was characteristic of the semidesert.

Discussion.—

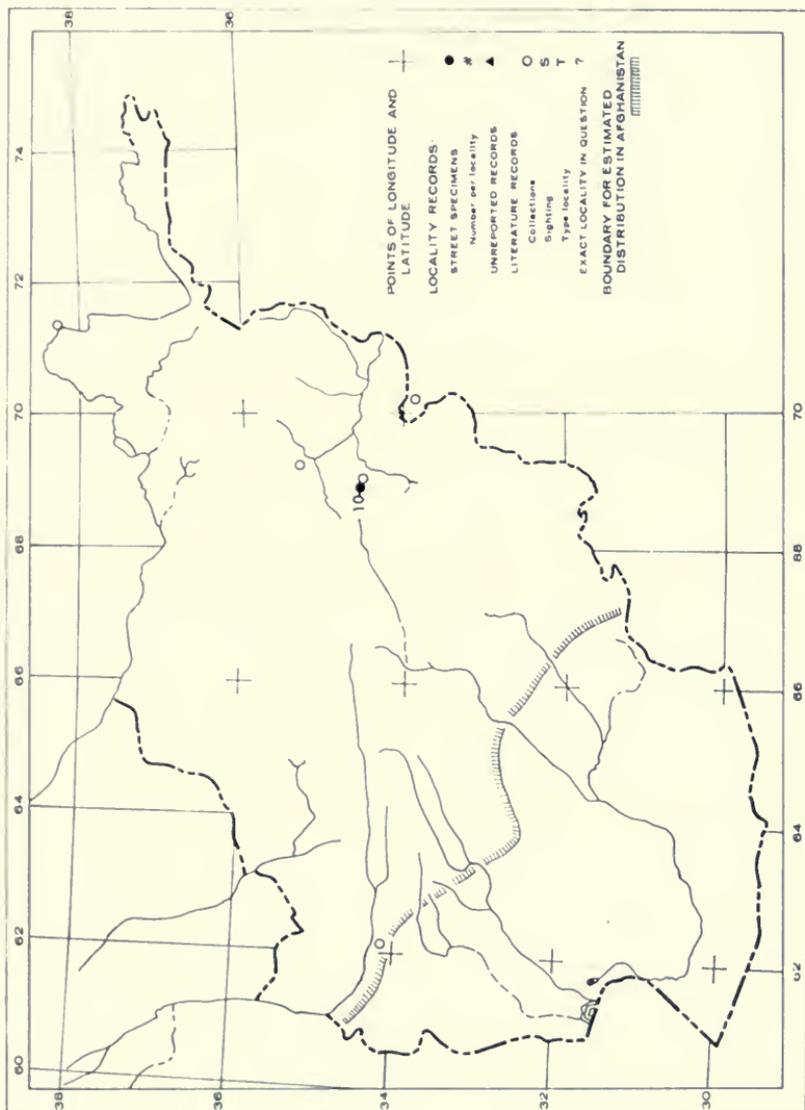
The overall appearance of the dorsal pelage for subadults is: Snuff to Hair Brown; for adults from Kamdesh: Verona to Snuff Brown; for adults from Kandahar: Verona to Orange Cinnamon; for adults from Herat: Orange Cinnamon to Sayal Brown; and for adults from North Afghanistan: Verona to Snuff Brown.

When the series of adults of the species of *Nesokia*, *Tatera*, *Ellobius*, and *Rattus* collected near or in Herat are compared each with series of their own species from other Afghan localities, they display the maximum amount of rusty orange hues in their dorsal pelage. Might a mineral prevalent in the soil around Herat facilitate the genesis of these hues?

The ventral pelage of Afghan *Nesokia* is grayish or buff, sometimes having white patches of irregular form. Adults from North Afghanistan show the most white, those from near Kandahar the least.

Forty-seven percent of the *Nesokia* collected from July through September (sample of 37) consisted of growing animals compared with 22 per cent for October and November (sample 28).

FIG. 25. Records and limits of distribution for *Dryomys nitidula*. Two extralimital records are from Bobrinsky et al. (1965, pl. 75), and Ellerman (1948, p 777).



Entrances to the burrow systems of this species are usually plugged shut. The "plug" is quite noticeable, filling a hole approximately 60 mm. in diameter. The locations of their burrows are revealed by mounds of earth not unlike those of *Ellobius*, but the plug is easier to find and remove because the burrow is about twice as large.

This species is a nuisance in cultivated areas where its burrowing habits damage irrigation works. The villagers, experts at catching *Nesokia*, rechanneled irrigation water into the burrows and clubbed inmates as they came out. Many subadult specimens were acquired by the Street Expedition in this fashion. Traps were not entirely satisfactory. Too many individuals were retrieved from our rat-size traps with broken skulls, apparently because the release of the trap mechanism triggered a withdrawal reaction of unusual speed in this species.

Dryomys nitedula Pallas

Forest Dormouse

Mus nitedula Pallas, 1779, Nov. Spec. Quad. Glir. Ord., 88.

Type locality.—U.S.S.R., region of Lower Volga.

Distribution.—

GENERAL: Southeastern Europe eastwards across Russian Turkestan to the Altai Mountains and southeast to the Kurram Valley near the southern border of Monsoonal Afghanistan, but in W. Pakistan.

AFGHANISTAN RECORDS: Ellerman (1948, p. 777), Niethammer (1965, p. 28).

1965 Street Expedition: FMNH 107800-09.

AFGHANISTAN HABITAT: Found between 1,000 and 2,800 m. in the rock, watercourse, and structure biotopes. Dense, stratified vegetation seems to affect favorably the abundance of this semiarboreal rodent, nevertheless, both Lay (1967) and Niethammer (1965) record this species from rocky areas with scant, low vegetation. To my knowledge this dormouse has never been found in habitat having sparse vegetation and no rocks. Perhaps the absence of a suitable climbing surface, rock or vegetation, precludes residence by *Dryomys*.

Discussion.—

Our series, all obtained in July, from the Paghman oasis consists of six adults, one subadult, and three nestling with their eyes closed.

One female collected July 18 was lactating, another taken the same date contained six embryos.

The dormouse was attracted to our stock bait. Many trap-nights in seemingly typical dormouse habitat in localities other than Paghman, failed to yield additional specimens. This suggests that the dormouse is sparsely distributed in mountainous Afghanistan, but locally abundant in especially suitable habitat such as the Paghman oasis. This oasis combines a perennial source of water, dense vegetation, and rocks with a good supply of food in the form of fruit orchards.

Jaculus blanfordi Murray

Greater Three-toed Jerboa

Jaculus blanfordi Murray, 1884, Ann. Mag. Nat. Hist., 14, p. 98.

Type locality.—Persia: Bushehr.

Distribution.—

GENERAL: The eastern basin region of Iran, South, and West Afghanistan, and northwest Baluchistan.

AFGHANISTAN RECORDS: 1965 Street Expedition: FMNH 103810-33; in alcohol 103832, -33.

Niethammer, (1966, *in litt.*, near Kandahar).

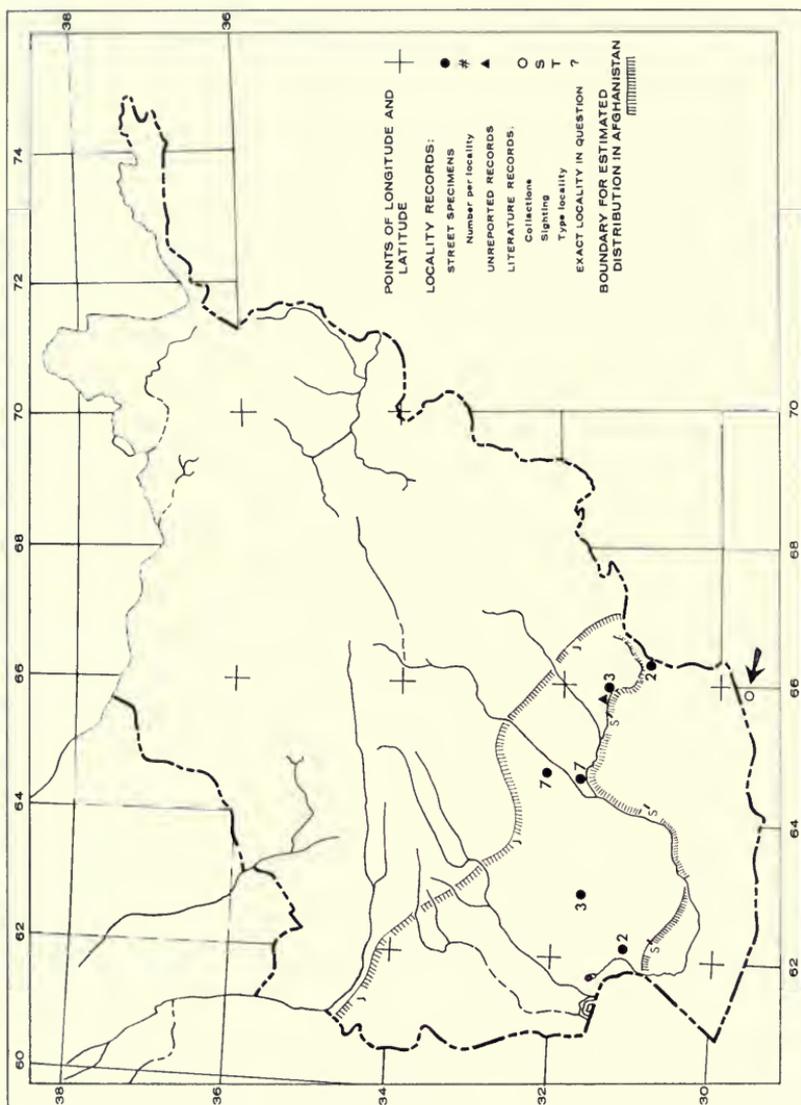
AFGHANISTAN HABITAT: Below 1,000 m. elevation in the sand, and clay-and-loess biotopes. Especially abundant in the ecotone between these biotopes. Characteristic vegetation: low-to-medium density, low shade, one or two strata, clumped distribution and low-to-high (usually high) homogeneity.

Discussion.—

We never caught *Jaculus* in traps. All of our specimens were collected between dusk and midnight with the help of at least three men, a net, shovel, and spotlight. We frequently drove more than 50 km. in a single night hunting for specimens. Jerboas were difficult to distinguish from the road, therefore, if possible, we traveled overland. Our hunting technique, described in the following paragraphs, applies for all Afghan dipodids.

Successful jerboa hunting required terrain flat enough for vehicular maneuverability and possessing clumps of semidesert vegetation separated by barren hard-packed clay, loess and/or sandy soil with or without a covering of pebbles and small stones.

We traversed such terrain in a zig-zag fashion cruising about 15 km. per hour. Initially we used spotlights in addition to our truck



headlights to search for prey, however, the headlights alone seemed to be just as effective, as our attention was concentrated. We seldom saw the slightly pink reflections of jerboa eyes before the whole animal was distinguished. Subsequently, we stopped or slowed the truck, enough to permit a man with a flashlight and net to disembark.

Often just after its discovery a jerboa froze. We tried to keep it blinded in this posture with a spotlight, giving the man on foot a chance to approach within netting distance. With a net 400 mm. in diameter on the end of a meter-long handle, we caught about 30 jerboas in this manner. If when first discovered the jerboa kept running, or if the collector failed to net the jerboa with his initial lunge, both truck and collector rushed in pursuit. About 60 jerboas were chased over distances ranging from 25 m.—1.5 km. Roughly half of these pursuits ended with the jerboa getting tangled in vegetation long enough to be netted.

A few long chases over rather featureless terrain ended at small, moundless holes, and two *Jaculus* so driven to earth were dug out. Each of these two burrows ended in a small nest about a half meter below the surface of the soil and 1.5 m. from the entrance. There were one or two short, lateral tunnels, one ascending from a point near the nest to terminate just below the surface of the soil, and not visible at the surface. If these serve as escape hatches when some burrowing predator starts digging into the main entrance, they were not so used to escape us, perhaps because we had already run the animal to earth.

On dark nights in jerboa habitat we seldom returned from this kind of hunting with less than 10 specimens. If we collected or even saw as many as three animals, of any species, on a bright moonlight night, we were fortunate. For example, the night of September 4 was brightly lit by a declining moon when, stimulated by the sight of a single *Allactaga*, we thoroughly but fruitlessly combed an alluvial plain located about 15 km. south of Balkh. After an hour we were ready to quit, but about this time the moon disappeared below the horizon, and simultaneously jerboas appeared. We collected 12 within 45 minutes and saw at least four more. Night hunting for jerboas was definitely poorest when the moon was full.

FIG. 26. Estimated limits of distribution for *Jaculus blanfordi* (J) and *Salpingotus michaelis* (S'). All records in Afghanistan are for *Jaculus*. An arrow points to an extralimital record for *Salpingotus*.

The barren habitat preferred, indeed required, by these saltatorial rodents affords little cover and paradoxically necessitates longer excursions for food, hence longer exposure to predation. Our observations suggest jerboas use darkness for cover thus avoiding bright moonlit nights.

Allactaga elater Lichtenstein

Small Five-toed Jerboa

Dipus elater Lichtenstein, 1825, Abh. Akad. Wiss. Berlin, p. 155.

Type locality.—Western Kazakstan (see Vinogradov, 1937, p. 119).

Subspecies reported from Afghanistan:

Allactaga elater indica Gray

Allactaga indica Gray, 1842, Ann. Mag. Nat. Hist., 10, p. 262.

Type locality.—Afghanistan: Simkoh Hills (Lectotype: adult (?) B.M. no. 44.9.15.4, from Kandahar).

Distribution.—

GENERAL: Northern Caucasus, Russian Turkestan, and the Iranian Plateau.

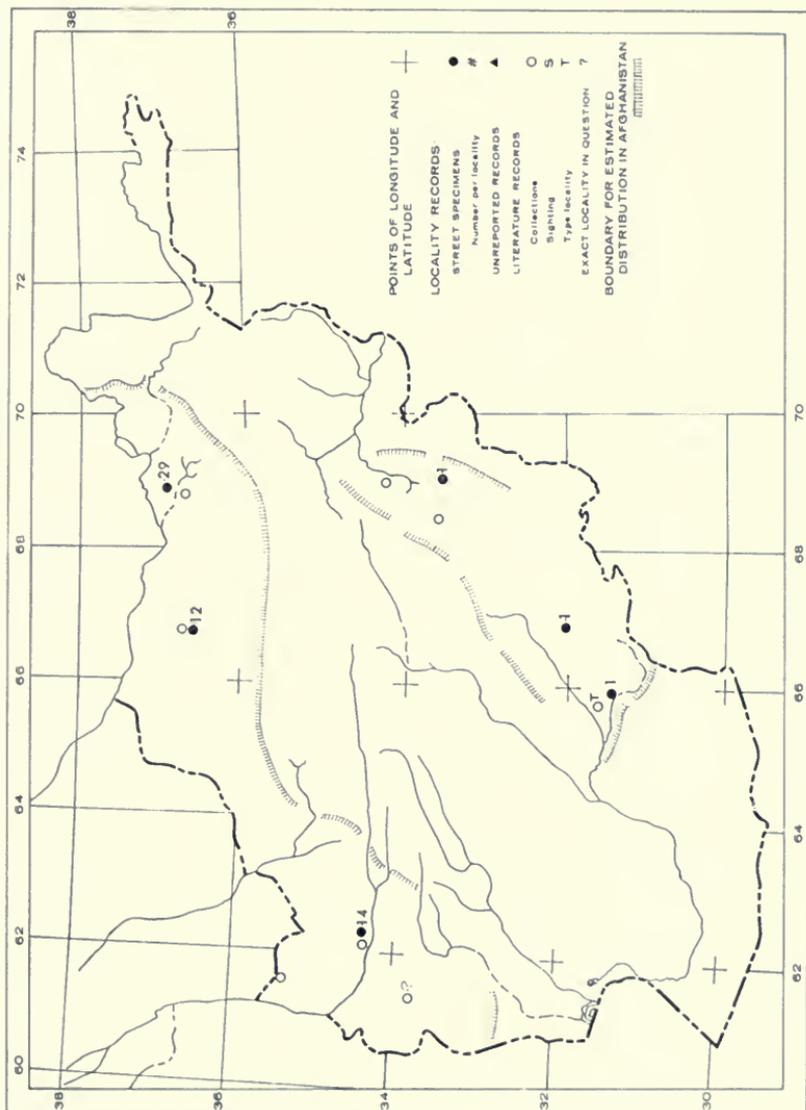
AFGHANISTAN RECORDS: Gray (1842, p. 262), Hutton (1846, p. 137), Griffith (1847, pp. 366, 370, 372), Aitchison (1889, p. 60), Ellerman (1948, p. 773), Niethammer (1965, p. 26), Gaisler et al. (1967, p. 361).

1965 Street Expedition: FMNH 103835—892, in alcohol 103837, -50, -57, -74, -75.

Niethammer (1965, p. 26) reported *Allactaga elater* from the road between Girishk and Dilaram. But on the basis of measurements (by Niethammer, 1969, in litt.; see Table 13) and distribution, these specimens are herein considered to be, and reported as, *Allactaga hotsoni*.

AFGHANISTAN HABITAT: Between 400 and 2,500 m. in the clay-and-loess and slope-and-plateau biotopes, with or without a covering of small stones. Characteristic vegetation: low-to-medium density, low shade, one or two strata, clumped distribution and medium-to-high (usually high) homogeneity.

FIG. 27. Records and possible disjunct distribution shown for *Allactaga elater*. Distribution is provisional, pending additional surveys in South and West Afghanistan. Type locality (T) for *A. elater indica* is for lectotype, BM 44.9.15.4, from Kandahar.



Most numerous in the steppes of North Afghanistan.

Discussion.—

Although this species is smaller than *A. euphratica*, and on the average has shorter mystacial vibrissae and a shorter tail than *A. hotsoni*, the morphology of the hind foot was found here to be the most reliable method of distinguishing skins of *elater* from those of *hotsoni*. (Note: The skulls of *A. hotsoni* have larger bullae.) The mean and extreme of distance from the end of the nail of the fifth toe to the most distal edge of the third toes' plantar tubercle multiplied by the greatest transverse diameter of this tubercle (these tubercles, excluding the toe nail, are laterally compressed, therefore the greatest transverse diameter is a dorso-ventral measurement), for 14 adult *elater* is 63–82 (73) mm., and for five *hotsoni* is 106–134 (116) mm. Although these indices are for dried skins, the fact that the indices for four *elater* and one *hotsoni* that we preserved in alcohol are respectively: 72, 77, 88, 92, and 154 mm., suggests that this difference will be similar in fresh specimens.

The methods used to catch these jerboas is described in the species account of *Jaculus blanfordi*.

A single specimen was taken from the mouth of a fox. It was dead but its skin was unbroken.

No sign of jerboas was seen in the Jalalabad Vale. We traversed at least 200 km. of typical jerboa habitat while night hunting without seeing a single specimen. In similar habitat where jerboas did occur, we should have seen perhaps 10 individuals in that much hunting.

Allactaga hotsoni Thomas

Hotson's Five-toed Jerboa

Allactaga hotsoni Thomas, 1920, Jour. Bombay Nat. Hist. Soc., 26, 4, p. 936.

Kant, 20 miles southwest of Sib, Persian Baluchistan.

Type locality.—Kant (= Kont 27.00 N 61.57 E): 20 miles southwest of Sib, 3,950 ft., Persian Baluchistan.

Distribution.—

GENERAL: Persian Baluchistan and South Afghanistan. Until the Street Expedition obtained six specimens, this species was known only by the type.

AFGHANISTAN RECORDS: Niethammer (1965, p. 26).

1965 Street Expedition: FMNH 103893–898, in alcohol 103896.

TABLE 13.—Body measurements of Dipodidae from Afghanistan.
(Measurements in mm., except as noted.)

Species	Record	Sample	Head and body	Tail	Hind foot	Ear
<i>J. blanfordi</i>	1965 Street Exp.	24	123-148(135)	170-202(184)	65-78(69)	21-28(25)
<i>A. elater</i>	Gray (1842) ¹	1	3.6''(91)	6.0''(152)	2.0''(51)	—
	1965 Street Exp.	58	88-119(103.9)	138-185(164.3)	46-57(52)	29-39(34.1)
<i>A. holsoni</i>	195 Street Exp.	6	104-111(106.7)	165-194(180.8)	53-59(55.4)	33-38(36.1)
	Niethammer (1969, <i>in litt.</i>)	6	101-108(104.7)	170-193(185.3)	51-55(53.1)	—
<i>A. euphratica</i>	Ellerman (1948) ²	1	126	205	64	47
	Ellerman (1948)	5	120-140(132)	195-225(206)	62-68(65)	47-52(49)
	1965 Street Exp. ³	6	109-129(118)	172-195(183)	54-61(59)	43-49(47)
		1	101	—	65	39

¹ Type for *Allactaga elater indica* Gray.

² Type for *Allactaga euphratica caprimulga* Ellerman.

³ Six adults from the Paghman escarpment and one purchased subadult from the Shibar Pass Region.

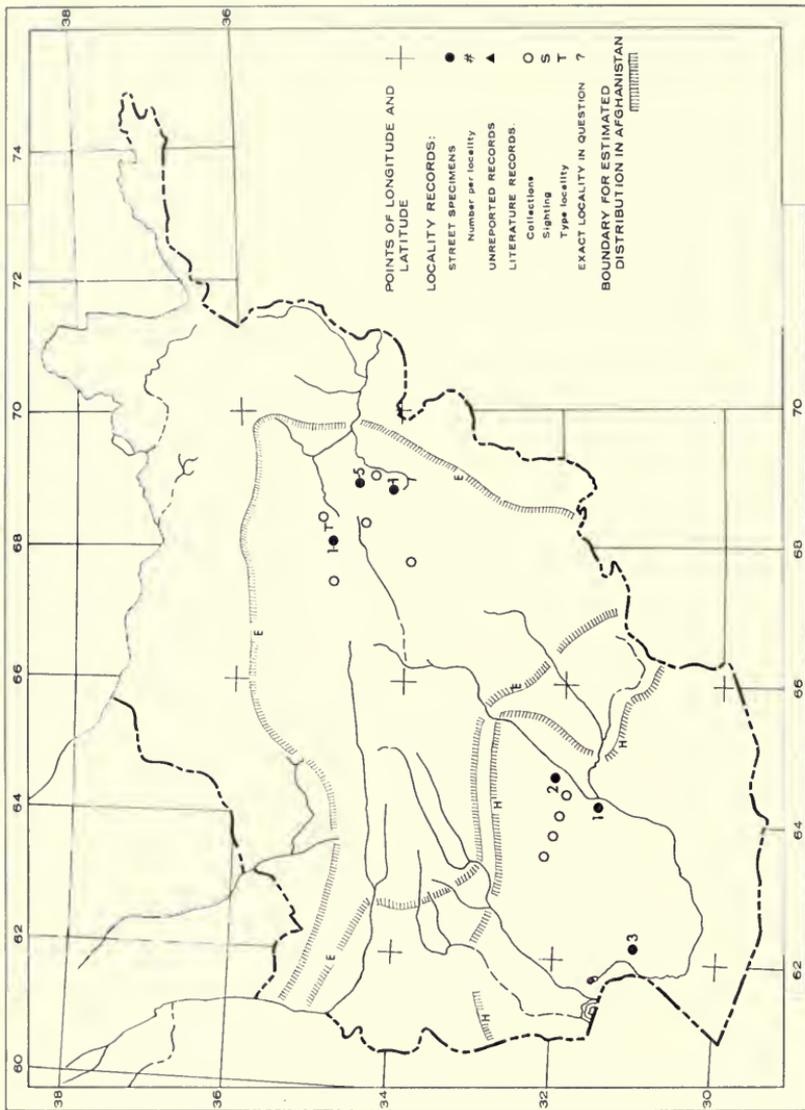


FIG. 28. Records and estimated limits of distribution for *Atactaga ephratICA* (E) and *Atactaga hotsoni* (H).

Niethammer's (1965) records from between Girishk and Dilaram were reported as *A. elater*, but measurements by Niethammer (1969, in litt.; see Table 13), and distribution provide evidence for including these specimens as *hotsoni*.

AFGHANISTAN HABITAT: Collected below 1,000 m. in the clay-and-loess biotope. Characteristic vegetation: low-to-high (usually low) density, low shade, one stratum, irregular (usually clumped) distribution, and high homogeneity.

Discussion.—

Thomas (1920, p. 936) describes *hotsoni* as: "A very long-eared jerboa of medium size." I was privileged to examine the type. The evidence from larger samples available now agrees, in part, with Thomas' description in that on the average *hotsoni* is larger than *elater* and smaller than *euphratica*. But the length of the ears of *hotsoni* is also intermediate. The most distinguishing character of *hotsoni* is the large size of the bullae, as Thomas points out: "Bullae very large, larger even than in the much larger *A. williamsi* [*euphratica*] . . ."

Between Girishk and Musa Qala one adult male *A. hotsoni* was collected with *Jaculus* on a large, flat, pebble desert, almost barren of vegetation, and at least 2.4 km. from free water. Near Kang *hotsoni* were foraging among a scattering of camel's thorn and bunch grass on flat, hardpan clay. There were sand dunes within 50 to 100 m., but pursued jerboas avoided this sand. One jerboa after being chased for 100 m., escaped into a small hole penetrating the hard-pan clay. There was no vegetation or noticeable break in the natural relief of the land within 15 m. of this hole.

Allactaga euphratica Thomas

Euphrates Jerboa

Allactaga euphratica Thomas, 1881, Ann. Nat. Hist., 8, p. 15.

Type locality.—Iraq.

Subspecies reported from Afghanistan:

Allactaga euphratica caprimulga Ellerman

Allactaga williamsi caprimulga Ellerman, 1948, Proc. Zool. Soc. London, 118, p. 774.

Type locality.—Afghanistan: Shibar Pass.

Distribution.

GENERAL: Transcaucasia, Asia Minor, Syria, Jordan, northern Saudi Arabia, Iraq, Iran, and Afghanistan.

AFGHANISTAN RECORDS: Ellerman (1948, p. 774), Niethammer 1965, p. 26).

1965 Street Expedition: FMNH 103834, -99, -04.

AFGHANISTAN HABITAT: Found between 1,800 and 3,200 m. in the slope-and-plateau and structure biotopes of dry, montane regions, and in the ecotone between these biotopes and the rock biotope. Characteristic vegetation: low-to-high density, low shade, one stratum, irregular (mostly clumped) distribution and low-to-medium homogeneity.

Taxonomic Notes and Discussion.—

Ellerman (*supra cit.*) described subspecies *Allactaga williamsi caprimulga* from Afghanistan. Subsequently, Niethammer (1965, p. 26) and Hassinger (1968, p. 75) reported new Afghan locality records for this species. On the basis of a recent revision by Atallah and Harrison (1968), these records are now referred to *Allactaga euphratica caprimulga*, as these authors conclude: "The conspecificity of *Allactaga euphratica* and *Allactaga williamsi* is established on examination of specimens from Turkey, Syria, Jordan, Kuwait, Iraq, Iran, and Afghanistan. *A. williamsi* is reduced to subspecific status representing a large race of *A. euphratica* . . . and . . . *A. e. caprimulga* from the Hindu Kush (Afghanistan) is considered a perfectly valid subspecies."

Lay (1967, p. 199) in a brief comparison of the type for *A. hotsoni* and the type series of *A. e. caprimulga* from the Shibar Pass, suggests these species may turn out to be synonymous; as here established, *hotsoni* is a slightly smaller species with proportionally larger bullae (see table 14). Furthermore, in Afghanistan *euphratica* has been collected in the mountains above 1,800 m. (9 localities); while *hotsoni* has only been found in deserts below 1,000 m. (3 localities).

Field Notes and Discussion.—

Approximately 50 traps were placed at burrow openings between or under rocks which supported an unused, crumbling bridge located

TABLE 14.—Skull measurements of *Allactaga* spp. from Afghanistan.

Character	(Measurements in mm.)		
	43 Adult <i>A. elater</i>	5 Adult <i>A. hotsoni</i>	6 Adult <i>A. euphratica</i>
Occipitonasal length	20.5–28.0 (26.1)	26.7–29.1 (27.6)	29.3–31.0 (30.1)
Zygomatic width	18.3–21.5 (20.0)	18.6–20.5 (20.0)	not taken
Bullar width	5.5–6.3 (5.9)	6.2–7.1 (6.6)	6.1–6.6 (6.4)
Bullar length	7.3–8.2 (7.7)	8.2–9.5 (8.8)	7.6–8.2 (7.9)

about 32 km. WSW of Kabul and covering a small stream. Cultivated wheat was growing within 10 m. of this structure. The only trap sprung was empty, but its victim, a male jerboa, lay nearby. In hot pursuit at night we netted five more between Paghman and Kabul, and saw another five, of which two disappeared under boulders and a third in a hole penetrating the base of an earthen wall. *A. euphratica* lives in higher and rougher terrain than any other Afghan species of jerboa, which is at least part of the reason we obtained only seven specimens.

Salpingotus michaelis FitzGibbon

Dwarf Jerboa

Salpingotus michaelis FitzGibbon, 1966, Mammalia, **30**, pp. 431-440.

Type locality.—W. Pakistan: northwestern Baluchistan: Nushki, approximately 29°N, 66°E, 3,500 feet.

Distribution.—

GENERAL: Known only from the Nushki Plateau in West Pakistan.

AFGHANISTAN RECORDS: None.

AFGHANISTAN HABITAT: Presumably will be the sand biotope below 1,500 m.

Discussion.—

This species account is actually concerned with two species (*Salpingotus michaelis* and *S. thomasi*), neither of which have yet been proven to occur in Afghanistan. The eventual collection of *S. michaelis* there seems almost a certainty as Nushki is less than 30 km. from the border of South Afghanistan and there are no obvious physical or climatic barriers which would restrict this jerboa to W. Pakistan. In fact, a specimen was collected by L. P. Richards about half way between Nushki and the Afghan border, being found adjacent to sand dunes. His specimen (AMNH 212118) is lodged in the American Museum of Natural History. Mr. Richards also collected *Gerbillus cheesmani*, *Meriones libycus*, and *Jaculus blanfordi* from the same general locality. Our expedition encountered a seemingly identical community in Afghanistan about 7 km. west of Spin Baldak (and 160 km. north of Nushki), complete with sand dunes, where, with the exception of *Salpingotus*, we collected the same species found north of Nushki. Jerboas other than *Salpingotus* rarely entered our traps, and our vehicular-method of night hunting for jerboas was not adequately adapted to the sand biotope for an

intensive search for *Salpingotus*. A concentrated effort within the sand biotopes west of Spin Baldak and south and east of the Helmand river would probably have resulted in collections of *S. michaelis* from Afghanistan.

The species *S. thomasi* is known only from the type (B.M. 79.11.21.433), a specimen originally in the East India Company's Museum with the label "Afghanistan, W. Griffith." Vinogradov (1928, p. 373) described this specimen as *S. thomasi* n. sp., giving its type locality as: "Probably Afghanistan." Later, Vinogradov (1937, pp. 96, 97) had second thoughts about the type locality saying: ". . . the exact locality of the third species—*S. thomasi* is unknown; according to the itinerary of Griffith's journeys, this specimen was acquired in southern Afghanistan or southern Tibet. Therefore, it is possible to surmise that the genus *Salpingotus* is widely distributed in Central Asia from the northern part of the Mongolian Altai across the Gobi desert, in the south it possibly reaches as far as southern Tibet (the locality in Afghanistan is less probable)." I have established (pp. 44, 45) that certain other localities on the labels of specimens collected by Griffith cannot be accepted at face value and recognize that Vinogradov's uncertainty is justified.

Since this psammophilous genus has been found in such widely separate localities as Nushki in West Pakistan (Fitz-Gibbon, 1966, p. 431), south of Lake Balkhash (Trukhachev, 1965, p. 1429), the Central Gobi and the northern portion of the Mongolian part of the Altai range (Ognev, 1948, p. 83) it seems reasonable to assume that either the same or additional species will be collected in other low (below 1,500 m.), sandy, Asian deserts. Although the relatively secretive species constituting this genus are rare in museum collections, the fact that four species have already been described suggests that the intermittent occurrence of its typical habitat (i.e., sand) provides this highly specialized, saltatorial rodent with ample opportunity to speciate. Nevertheless, now that *S. michaelis* is known to be from the Pakistan-Afghanistan border, it seems more likely that *S. thomasi* will be found to occur in a sandy desert that is separated from the range of *S. michaelis* by a strong natural barrier. Griffith could have collected the type of *S. thomasi* in any stretch of sand desert on his route between Baluchistan and Bhutan, but assignment of a type locality for it must logically now wait until specimens like the type specimen become known to science from some point on Griffith's route.

The measurements for the types of *S. thomasi* and *S. michaelis* are respectively: HB, 57.0, 41.5; TL, 105.0, 82.0; HF, 23.0, 19.0; and E, 9.0, 8.9. *S. thomasi* is a larger species and, excepting the ear, shows no size overlap with any of 15 specimens of *michaelis*. Fitz-Gibbon (1966, p. 437) also gives comparative skull measurements and those portions of the *thomasi* skull which are measurable are larger than their counterparts in *michaelis*.

Hystrix indica Kerr

Hystrix cristata var. *indica* Kerr, 1792, Anim. Kingdom, p. 213. Based on Smellie's *Buffon*, 1781, 7, pl. 206.

Type locality.—India.

Distribution.—

GENERAL: Ceylon, India, Arabia, across the Iranian Plateau to Russian Turkestan.

AFGHANISTAN RECORDS: Hutton (1846, p. 136), Griffith (1847, p. 420), Aitchison (1889, p. 62), Ellerman (1948, p. 766), Dupree (1955, p. 525; 1956, pp. 299–300), Niethammer (1965, p. 26), Gaisler et al. (1967).

1965 Street Expedition; FMNH 103905–08, skull only 103907, -08.

Third Danish Expedition, 1948–1949 (Gusalek, N. of Pashki, Obek, and Bamian). Niethammer (1967, *in litt.*, near Kabul).

AFGHANISTAN HABITAT: Found throughout Afghanistan below 2,600 m. in the clay-and-loess, rock, watercourse, and structure biotopes. The rock biotope is the typical refuge of this species. Quills were frequently found in caves.

Discussion.—

Corbet et al. (1965, p. 296) observed: “. . . of the five cranial characters studied that show clear differences between the North African *H. cristata* and the Indian *H. indica* two show no tendency towards an intermediate condition in the southwestern Asiatic group. These are the relative length of the nasals (including frontal: nasal ratio); and the height of the skull.” These findings were based on five specimens from southwest Asia. I have examined seven additional specimens (Iran, 5; Afghanistan, 2) from southwest Asia. My studies support Corbet, but with the following exception: a specimen from Gorgan, Iran, was intermediate between *indica* and *cristata* in the relative length of the nasals and the height of the skull. Externally the skin of this specimen was typical of *indica*.

headwaters of the Helmand River near Kandahar and Girishk. Higher, near Ghazni, I saw but a single jackal, while higher still near Kabul we failed to sight *Canis aureus* at all. Eastward and lower in the Jalalabad Vale frequent observations of the jackals suggested it to be at least as numerous as near Kandahar. To me these observations indicate that jackals were relatively scarce in North Afghanistan and at higher elevations farther south.

Near Herat two packs, each containing five (possibly more) jackals, were seen. At night this species boldly ranged within the city of Herat. I saw one leap to the top of a low wall and run along the top of this wall for 6 m. before jumping into the "protected" garden on the other side. Ognev (1931, pp. 226, 227) reports on the omnivorous nature of the species, a characteristic causing many Afghan farmers to guard their crops at night by sleeping in the fields when crops are ripening, usually accompanied by a dog and a lantern. On one occasion we shot a jackal a mere 10 m. from a guard and his dog, awakening both.

Jackals were harder to collect than foxes because of the situations they were found in. They were expert at utilizing cover such as a ditch or row of trees.

***Vulpes cana* Blanford**

Blanford's Fox

Vulpes canus Blanford, 1877, Jour. Asiat. Soc. Bengal, 46 (2), p. 321.

Type locality.—W. Pakistan: Gwadar.

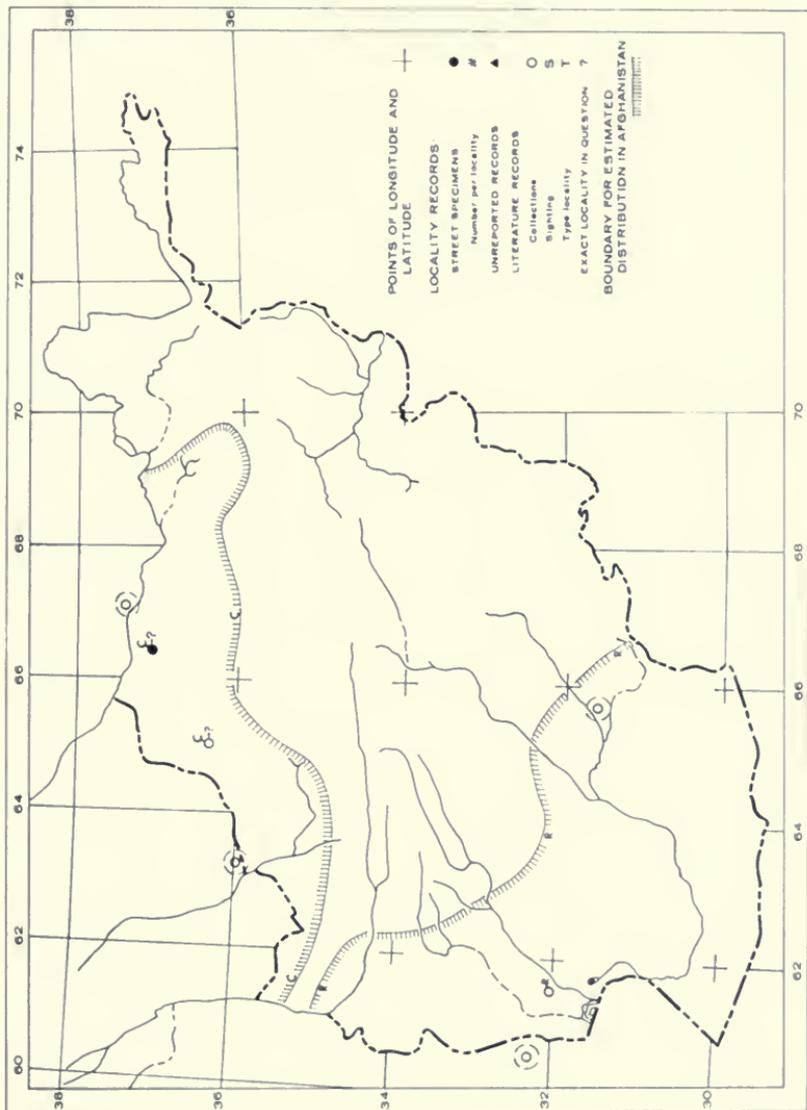
Distribution.—

GENERAL: The Iranian Plateau (see Lay, 1967, p. 206).

AFGHANISTAN RECORDS: Blanford (1888–1891, p. 150).

AFGHANISTAN HABITAT: Probably found below 2,000 m. in dry montane biotopes. There are few data on the habitat of this species, but distribution records from the USSR, Iran, W. Pakistan, and Afghanistan are from mountains and foothills (or never more than 50 km. from same) bordering or near lower plains and basins.

FIG. 31. Records and estimated limits of distribution for *Vulpes corsac* (C) and *Vulpes ruppelli* (R), and records for *Vulpes cana* (circled, and three extralimital). Very little is known about the habits and habitat of *V. cana*. Its range in Afghanistan may roughly conform to the foothill country found along and on both sides of boundaries C and R.



Douglas (a British subject), mentioned that while hunting in the vicinity of the Anjuman Pass in October he passed a herd of sheep and goats from which 55 had been killed by wolves during the night.

Wolf skins are plentiful in the fur bazaars of Afghanistan. Our expedition purchased a single skin in Herat, which ostensibly came from the low hills north of the city.

Canis aureus Linnaeus

Jackal

Canis aureus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 40.

Type locality.—Iran: Lar Province (former province presently located within Fars Province at about 28° N, 54° E).

Distribution.—

GENERAL: The Oriental Faunal Region and in the Palearctic Region from Russian Turkestan and the Iranian Plateau eastwards to Greece and southwards: to Senegal, the Sudan, Somaliland, Abyssinia, and Kenya in the Ethiopian Faunal Region.

AFGHANISTAN RECORDS: Hutton (1845, p. 344), Aitchison (1889, p. 57), Kullman (1965, p. 10), Gaisler et al. (1968, p. 186).

1965 Street Expedition: FMNH 103909, -20; 103912, skull only.

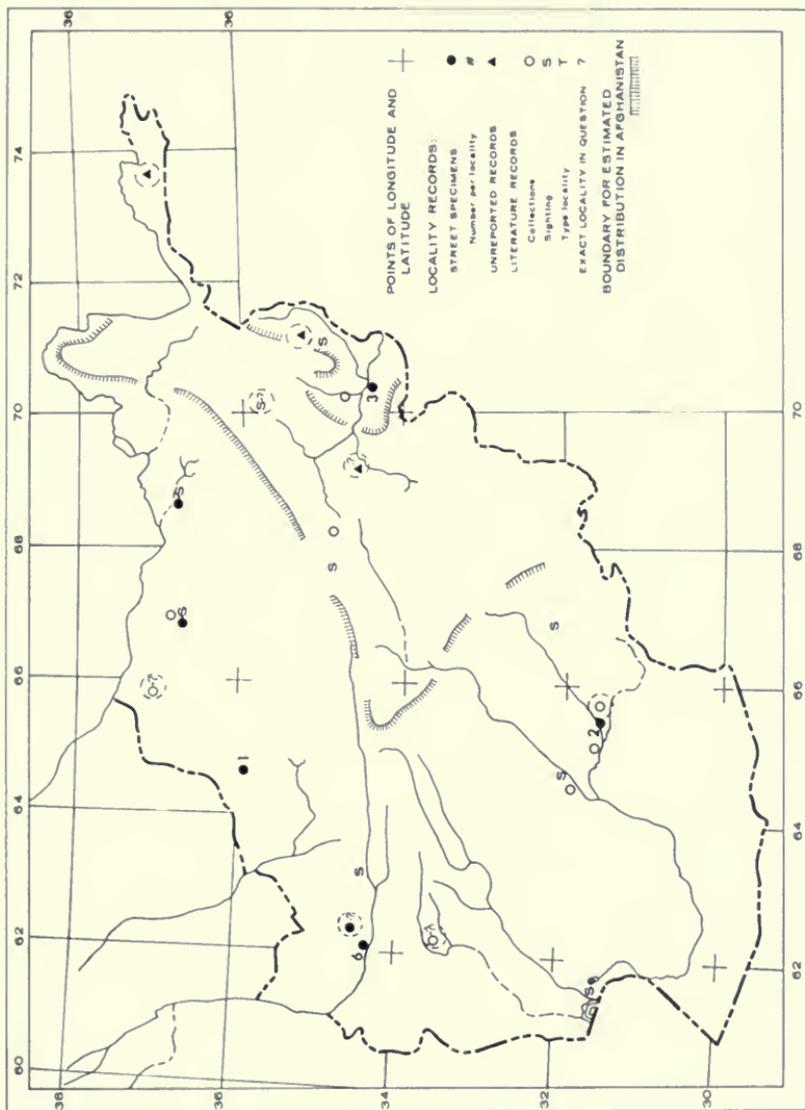
Third Danish Expedition, 1948–1949, (sight records at Gusalek, N. of Kandahar, Bagrabad, Obeh, Bamian).

AFGHANISTAN HABITAT: Common below 2,000 m. in the structure, and watercourse biotopes of dry Afghanistan. This species ranges through other biotopes, but was never seen more than 2 km. from an oasis or river bottom. Traveling away from such habitat, the frequency with which we saw jackals decreased while the probability of seeing a fox increased.

Discussion.—

In North Afghanistan we saw solitary jackals once each at Kunduz and Mazar-i-Sharif compared with at least 30 sightings near Herat in West Afghanistan. We also saw them frequently along the

FIG. 30. Records for *Canis lupus* (circled) and *Canis aureus* (not circled). *Canis lupus* occurs throughout Afghanistan. Pending additional surveys, a discontinuous boundary is used to show provisional limits of distribution for *C. aureus*.



The following body measurements are recorded for two adult male *Hystrix* collected by the 1965 Street Expedition: HB, 638, 668; T, 72, 120; HF, 99, 106; and E, 43, 42.

Porcupines are common in Afghanistan. Our specimens were shot at night. Regarding this species, depredation on crops, Hutton (1846) asserts: ". . . they commit sad havoc in the grainfields and gardens. They are entrapped in pitfalls, and likewise shot."

Porcupines trying to elude capture surprise one with their agility, and resort to climbing up instead of down in the mountains, especially toward broken terrain with scattered boulders rather than more open country.

Order CARNIVORA

Canis lupus Linnaeus

Wolf

Canis lupus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 39.

Type locality.—Sweden.

Distribution.—

GENERAL: Holarctic. Found in suitable habitat in the Palearctic Region and northern half of the Indian Faunal Subregion.

AFGHANISTAN RECORDS: Hutton (1845, p. 345), Scully (1881, p. 224); (1887, p. 69), Aitchison (1889, p. 57), Kullman (1965, p. 9), Gaisler et al. (1968, p. 186).

1965 Street Expedition: FMNH 103921.

Third Danish Expedition, 1948–1949 (Pashki, Kabul). Garber (1963, *in litt.*, Wakhan Region).

AFGHANISTAN HABITAT: Ranging throughout montane Afghanistan. Garber (1963) shot two above 4,000 m. in the Wakhan Region. Kullman (1965) remarks: "Wolves . . . are apparently widely distributed in Afghanistan, wherever they can withdraw to the hills in summer."

Discussion.—

Wolves are common in Afghanistan. Kullman (1965) mentions: "They generally appear in winter at the gates of Kabul." Dr. C.

FIG. 29. Records for *Hystrix indica*. Estimated distribution: below 2,600 m. throughout Afghanistan. Street Expedition records and dotted literature records are based on specimens. Undotted literature records and unreported records are based on *Hystrix* quills, most of which were found in caves.

Discussion.—

Blanford (1881) cites the only record from Afghanistan, i.e., “. . . a skin from Kandahar sent to me by Sir O. B. St. John.” This record does not exclude the possibility that St. John might have purchased this skin from the Kandahar fur bazaar, but I saw no skins of this species in any fur bazaar, and the more substantial records of *V. cana* from the type locality and Baluchistan (Blanford, 1881, pp. 150–151; Siddiqi, 1961, p. 140), from Iran (Lay, 1967, p. 206), and from near the border of North Afghanistan (Bobrinski, et al., 1965), leave little doubt that this species occurs in the mountains and hills of Afghanistan.

Vulpes corsac Linnaeus

Corsac Fox

Canis corsac Linnaeus, 1768, Syst. Nat., 12th ed., 3, appendix, p. 223.

Type locality.—Russian Asia: steppes between the Ural and Irtysh Rivers.

Distribution.—

GENERAL: From the Volgo-Ural steppes in Southeastern Russia eastwards to Sinkiang and Northern Manchuria; reaching its southern limits of distribution in North Afghanistan.

AFGHANISTAN RECORDS: Bobrinskii et al. (1965, p. 127), Kullman (1965, p. 10).

1965 Street Expedition, FMNH 103923, -24.

AFGHANISTAN HABITAT: Below 2,000 m. in the dry steppes of North Afghanistan.

Discussion.—

According to Kullman (1965): “The corsac . . . lives in lower parts in the dry country around Maimana, and skins are often made into beautiful covers in the Kabul Bazaar.” Our specimens, which purportedly were collected in North Afghanistan, were purchased in Kabul. I also inspected two blankets made of corsac fox skins, tails included. I counted sixty tails in one of these, which suggests that this species is not rare in Afghanistan, but the possibility that any or all of these skins are imported from the USSR should not be ignored.

Vulpes ruppelli Schinz

Sand Fox

Canis ruppellii Schinz, 1825, Cuvier's Tierreich, 4, p. 508.

Type locality.—Sudan: Dongola.

Distribution.—

GENERAL: Northern Africa and the Iranian Plateau.

AFGHANISTAN RECORDS: Aitchison (1889, p. 58).

AFGHANISTAN HABITAT: A single specimen was collected by Aitchison, Nov. 3, 1884, on the Dasht-i-Barang between Kushk-rud (451 m.) and Kin (463 m.) in predominately semi-desert habitat with a clay-and-loess substrate.

Discussion.—

Aitchison (1889, p. 58) lists *Vulpes famelica*, Ruppell, from Afghanistan. Ellerman and Morrison-Scott (1951, p. 231) consider this as belonging to the subspecies: *Vulpes ruppelli zarudnyi* Birula, 1912. Aitchison gives no measurements for this specimen. I could find no skins of this species in the fur bazaars that I visited in Afghanistan.

Vulpes vulpes Linnaeus

Red Fox

Canis vulpes Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 40.

Type locality.—Sweden.

Subspecies recorded for Afghanistan:

Vulpes vulpes griffithi Blyth.

Vulpes griffithi Blyth, 1854, Jour. Asiat. Soc. Bengal, 23, p. 730.

Type locality.—Afghanistan: Kandahar.

Distribution.—

GENERAL: Holarctic, north of the Sahara in Africa, and north-west India and the Himalayas.

AFGHANISTAN RECORDS: Hutton (1845, pp. 344, 345), Scully (1881, pp. 225, 226; 1887, pp. 69, 70), Aitchison (1889, p. 57), Kullman (1965, p. 10), Niethammer (1967), Gaisler et al. (1968, p. 186).

1965 Street Expedition, FMNH 103925-961, skull only 103930, -42, skin only 103932, -50.

Third Danish Expedition, 1948-1949 (Gusalek, Wama, Pashki, Jurm, Bamian).

AFGHANISTAN HABITAT: Common in every biotope below 3,000 m. We collected *V. vulpes* from steppes, semideserts, oases, and boulder covered mountains, but seldom saw them in habitat with vegetation having a high density, high shade, and three strata. In this respect they contrast with *Canis aureus*.

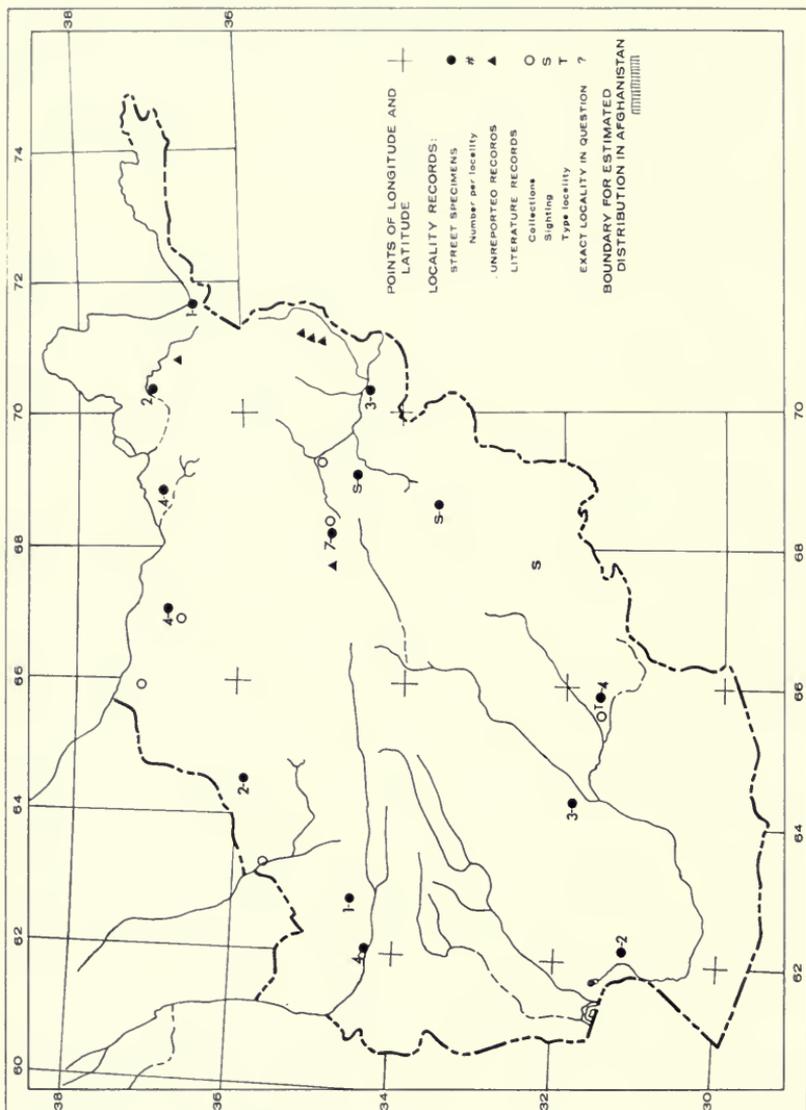


FIG. 32. Records for *Vulpes vulpes*. Estimated distribution: below 3,000 m. throughout Afghanistan.

TABLE 15.—Body measurements of some Canidae from Afghanistan.
(Measurements in mm.)

Species	Record	Sample	Head and body	Tail	Hind foot	Ear
<i>C. aureus</i>	1965 Street Exp.	12	630-792(702)	200-299(234)	146-163(156)	72-94(80)
<i>V. corsac</i>	1965 Street Exp.	2 ¹	550,—	280,—	—,—	40,60
<i>V. vulpes</i>	Hutton (1845)	1	610	432	—	—
	1965 Street Exp.	35	490-775(558)	295-465(394)	123-172(142)	88-113(99)
	1965 Street Exp.	4 ²	518-570(548)	350-420(386)	137-150(143)	95-107(103)

¹ Measurements are of tanned flat skins.

² Topotypes of *V. vulpes griffithi* from Kandahar, FMNH 103953 to 103956; measurements of these topotypes are also included in the above averages for 35 adult (or large subadult) foxes.

Discussion.—

The following names have been applied to *Vulpes vulpes* from Afghanistan: *Vulpes* [*flavescens*, Gray], Hutton (1845); *V. montana* and *V. griffithi*, Scully (1881, 1887); *V. persica*, Aitchison (1889); and *V. leucopus*, Selater (1891, p. 227). For the suggestion that these specimens represent *Vulpes vulpes griffithi* Blyth (1854, Jour. Asiat. Soc. Bengal, 23, p. 270) which was described from Kandahar, see Pocock (1941, pp. 121–123), and Ellerman and Morrison-Scott (1951, p. 227).

The variation in size and pelage color within our series of 35 specimens is quite extensive. Interestingly, our 35 adult (or large subadult) foxes from Afghanistan are on the average (see table 15) 92 mm. shorter than the *V. vulpes* from the USSR, which Novikov (1956, p. 57) distinguishes as: "Length of body 650 mm. or more."

Evidence indicates *Vulpes vulpes* is the most abundant wild carnivore in Afghanistan. Every furrier had at least one large robe made out of *V. vulpes* skins, consisting of from 20 to 40 matched pelts. Our expedition purchased eight such blankets. Foxes were equally abundant in the mountains or on the steppes. We saw as many as ten foxes in one night. Niethammer (1967) observes: "We set a record in September, 1966 as we saw 25 foxes in less than one hour while driving through the steppe near Ab-e-Istada after sunset."

We collected foxes at night with shotguns and lights. According to our observations of the stomach contents of fox specimens, jerboas are a common item in the diet of these foxes, and, like jerboas, the foxes were rarely seen on bright moonlit nights. We frequently chased foxes if the terrain was suitable. In one such chase the fox ran more than 3 km. with bursts of speed in excess of 30 mph (48 km. per hour) before escaping across a precipitous gully.

Selenarctos thibetanus G. Cuvier Atlantic Black Bear

Ursus thibetanus G. Cuvier, 1823, Ossements Foss., 4, p. 325.

Type locality.—Assam: Sylhet.

Distribution.—

GENERAL: Southeast Asia, Manchuria to Indo-China, and westward along the Himalayas and the edge of the Iranian Plateau reaching its westernmost limits of distribution, according to Lay (1967, p. 234), in the southeastern part of Kerman Province in Iran.

AFGHANISTAN RECORDS: Povolny (1966, pp. 305-316).

Third Danish Expedition, 1948-1949 (Gusalek, Wama, Pashki).

General references to Afghan bears (sp.): Elphinstone (1842), Irwin (1839), Griffith (1847, p. 405), Raverty (1859), and Aitchison (1889, p. 58). With the exception of Griffith, these authors allude to two kinds (colors) of bears, a black one (*Selenarctos* ?) and a red, brown, or yellowish one (*Ursus* ?).

AFGHANISTAN HABITAT: Above 1,500 m. in forests and sub-alpine meadows.

Aitchison's (1889) note, "At Bala-Morghab several persons who lived between that and Maimana told me that in the hills between these two places are to be got two kinds of bears, one red (called locally "Khirsa") and one black (called "Kull")," suggests that a bear may be occasionally found in the more open woodlands on the northern slopes of the Hindu Kush and Parapamisus mountains, but lack of more recent evidence fails to support such a distribution.

Discussion.—

Povolny (1966) provides a detailed account of the status of *S. thibetanus* in Afghanistan. He reports on a specimen (skeleton deposited in the Institute of Vertebrate Zoology, C.A.S. in Brno, Czechoslovakia, and mounted skin on display in the Moravian Museum in Brno) from: ". . . about 8 to 10 km. NE of the provincial town of Laghman lying on the border of southwestern Nuristan," and on a cub from near Gulbahar, a small town situated on a plateau 18 km. north of Charikar. This latter individual was interned alive at the Institute of Zoology and Parasitology in Kabul. Povolny shows that previous reports of *Selenarctos* from Afghanistan were, in fact, baseless, having their origin in a general statement on distribution made by Blanford (1888, p. 197), and repeated by: Ellerman and Morrison-Scott (1951, p. 239), Ognev (1931, p. 119), and Bobrinskii et al. (1965, p. 130). Povolny notes that none of these authors could offer a single documented occurrence or point to one in the literature to justify their inclusion of this species in the fauna of Afghanistan. He further reports that neither he nor Dr. Kullman could find skins of *Selenarctos* in the large skin bazaar in Kabul, and that the German and American expeditions did not succeed in obtaining any information whatsoever on the existence of *S. thibetanus*. Povolny contends that the occurrences he reports are the

first for *S. thibetanus* to be known from Afghanistan. He is correct just that far. However, Paludan, collecting for the Third Danish Expedition to Central Asia, was the first to obtain specimens—two skins of *Selenarctos* in Afghanistan. These skins were purchased in 1948 at Wama and Pashki, and are preserved in the University Museum at Copenhagen where I examined them in 1966. They have typically black pelage with a white spot on the thorax. In addition to these specimens, Paludan recorded the following on Feb. 29, 1948, at Gusalek: "A man was seen this afternoon with a small but untamed juvenile *Selenarctos*. The species is said to be very common here."

Ursus arctos Linnaeus

Brown Bear

Ursus arctos Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 47.

Type locality.—Sweden.

Distribution.—

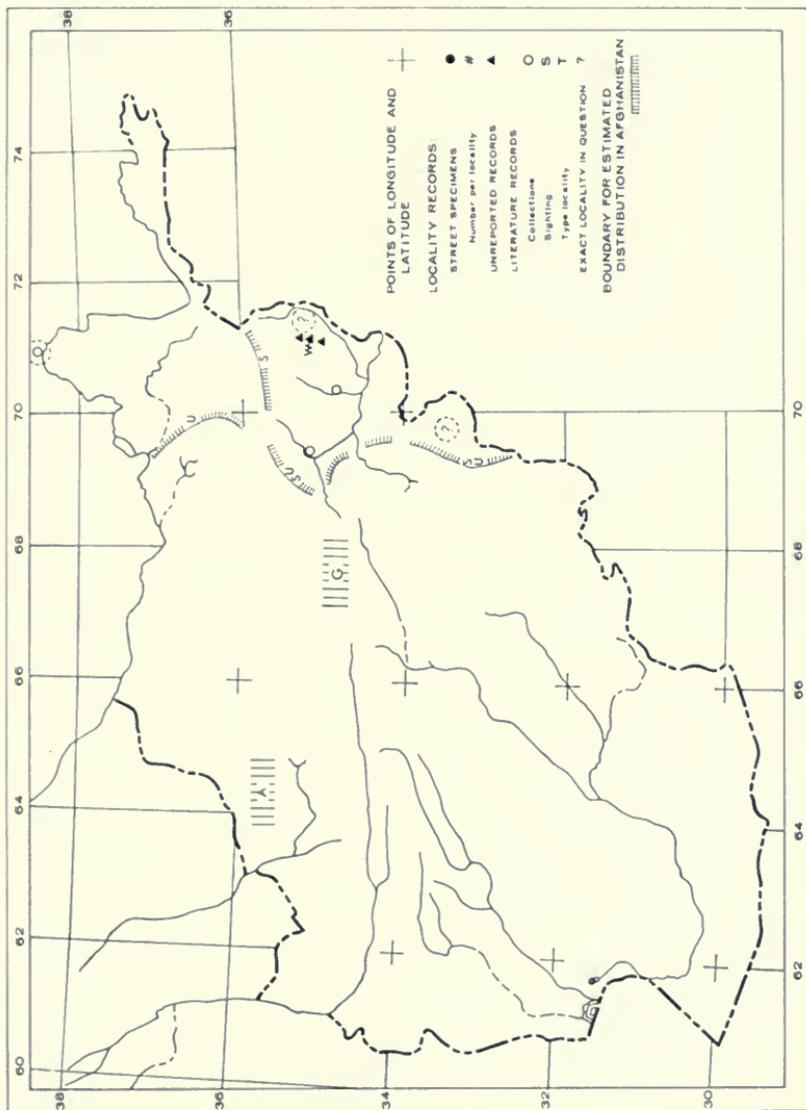
GENERAL: Europe, USSR, Japan, China, the Himalayas, parts of the Iranian Plateau, Asia Minor, and the northern part of the Arabian Peninsula. Found in the Punjab, but not south in peninsular India.

AFGHANISTAN RECORDS: General references to brown bears or *Ursus*: Elphinstone (1842), Irwin (1839), Griffith (1847, p. 405), Raverty (1859), Aitchison (1889, p. 58), Kullman (1965, p. 13), and Povolny (1966, p. 309).

Third Danish Expedition, 1948–1949 (Wama).

AFGHANISTAN HABITAT: Usually above 1,500 m. in forests, subalpine and alpine meadows. The generally lower and sparsely vegetated habitat west of the distributions illustrated in Figure 33 probably precludes permanent habitation by bears, although as noted for *Selenarctos* a bear may be occasionally found on the northern slopes of the Hindu Kush and Pamamis mountains.

FIG. 33. Records and estimated limits of current distribution for *Selenarctos thibetanus* (S) and *Ursus arctos* (U). Records for *Ursus* (one extralimital) are circled except for Wama (W) where skins, one each, of *Selenarctos* and *Ursus* were purchased. Question marks denote Provinces of alleged occurrence of *Ursus* (fide Kullman, 1965). Although Griffith (1847) and Aitchison (1889) report bears (sp.?) from regions G and A respectively, the lack of more recent evidence suggests bears no longer frequent these areas.



Discussion.—

As noted above and illustrated in Figure 33, only a single record for *Ursus* can be referred to an Afghan locality more specific than Nuristan or Paktia (Elphinstone, 1815; Irwin, 1839; Raverty, 1859; and Kullman, 1965), the environs of Bamian (Griffith, 1847), or the hills between Bala Morghab and Maimana (Aitchison, 1889). Of these authors only Kullman specifies *Ursus*, alleging: “. . . the bear (*Ursus arctos* . . .), lives in the forest regions of Afghanistan (Nuristan and Paktia). It is a predator but eats mainly vegetable food, e.g., it climbs mulberry trees in summer in Nuristan and eats the mulberries.”

Two additional records corroborate the existence of *Ursus* in Afghanistan: Ognev (1935, pp. 628, 629) describes a specimen of *Ursus pamirensis* (= *U. arctos isabellinus*, fide Ellerman and Morrison-Scott, 1951, p. 237) from “. . . some 15 to 20 km. from the frontier post of Kala-i-Khumba on the Pyrandzh River near the Afghanistan boundary (elev. 3,000 m.).” This extralimital, but important record is illustrated in Figure 33. Povolny (1966) observes: “Of the less frequent carnivores, we saw there [Kabul bazaar], a single skin of . . . the brown bear, *Ursus arctos* . . .”

I examined the skin which was purchased at Wama by members of the Third Danish Expedition. It fits the description of *Ursus arctos isabellinus* as given by Pocock (1941, p. 174), thus substantiating his inclusion of Afghanistan in the distribution of this subspecies.

The relative habitat requirements of *Ursus* and *Selenarctos* in Afghanistan remains unknown. A critical appraisal is needed of the ecology and variation of these species in Afghanistan and Kashmir, especially with respect to the rather nebulous allegations of a brown color phase for *Selenarctos*, see Pocock (1941, p. 203).

Mustela erminea Linnaeus

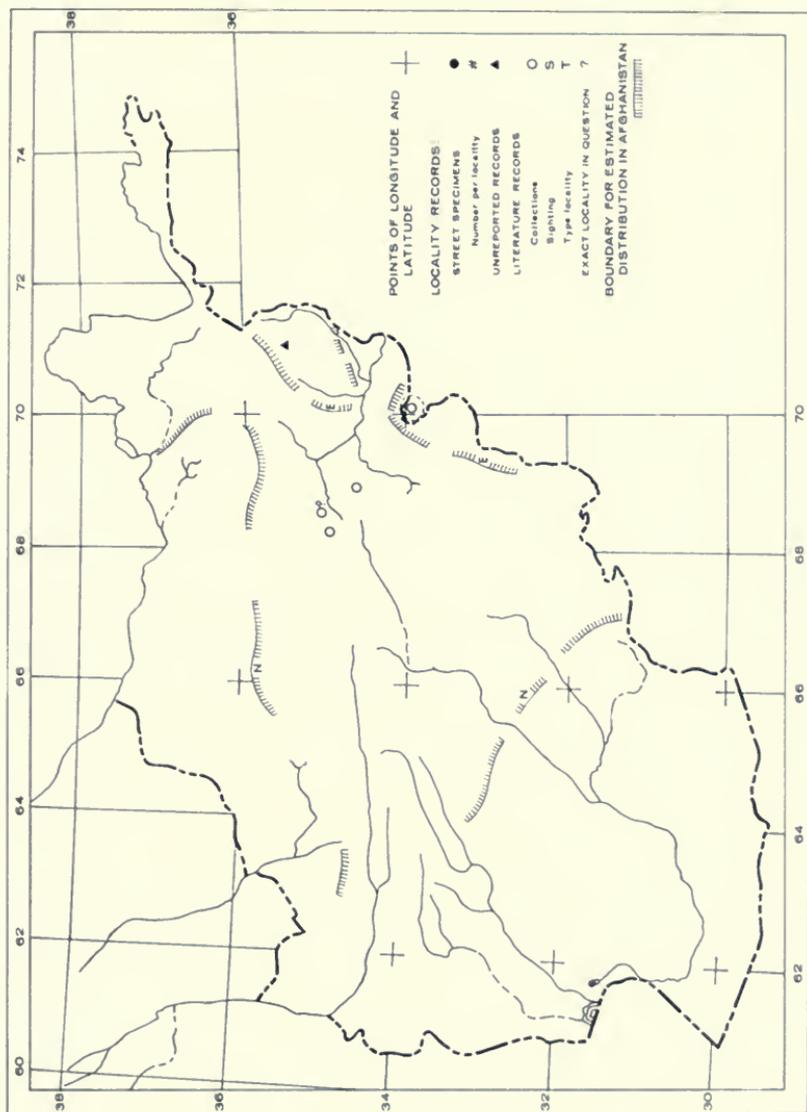
Ermine

Mustela erminea Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 46.

Type locality.—Sweden.

Distribution.—

FIG. 34. Records (circled and extralimital for *M. erminea*) and provisional limits of distribution for *Mustela erminea* (E) and *Mustela nivalis* (N). Unpublished record for *nivalis* (see text, p. 133) is based on a sighting of two weasels.



GENERAL: Holarctic. The mountains of Kashmir, W. Pakistan and Afghanistan demarcate the southern limits of this species' Asian distribution.

AFGHANISTAN RECORDS: See *Discussion*.

AFGHANISTAN HABITAT: Biotopes of wet habitat, as outlined by Hassinger (1968, pp. 52-54).

Discussion.—

Griffith (1847, p. 443), traveling in eastern Afghanistan notes: "I observed, and shot a weasel, or a mungoose today. It was eating carrion." Horsfield (1851, p. 104) in his *Catalogue of the Mammals in the Museum of the Hon. East India Co.*, lists *Mustela erminea*, with Griffith as collector. Subsequently Blanford (1888-1891, p. 166) states: "A specimen [of *M. erminea*] was obtained in Afghanistan by Griffith . . ." Ognev (1935, p. 36) without having looked at the specimen, reports this same record. Curiously, Barrett-Hamilton's (1900, pp. 48, 49) description of *Putorius* (= *Mustela nivalis pallidus*, n. subsp., is based on two specimens: the type from Russia and (BMNH 79.11.21.293) an ". . . unsexed skin from Afghanistan, from the Indian Museum collection." I have had the privilege of examining this paratype. It was collected by Griffith and is apparently the same specimen that Horsfield, Blanford, and Ognev (*supra cit.*) list as *M. erminea*. If this is indeed the case, then the single record of *M. erminea* from Afghanistan becomes instead one for *M. nivalis pallidus*. Although Ellerman and Morrison-Scott (1951, p. 258) recognize the subspecies *M. nivalis pallida*, they do not include Afghanistan, in its distribution.

Irrespective of the above record, *M. erminea* undoubtedly inhabits the mountains of monsoonal Afghanistan as Pocock (1941, p. 349) lists *M. erminea ferghanae* from Parrachinar (see fig. 34) in the Kurram Valley, W. Pakistan. Parrachinar is less than 20 km. in any of three directions (north, south or west) from the eastern border of Afghanistan. Also, Bobrinskii et al. (1965) show the southern limit of distribution for *M. erminea* in U.S.S.R. to be the border of the Wakhan.

***Mustela nivalis* Linnaeus**

Weasel

Mustela nivalis Linnaeus, 1766, Syst. Nat., 12th ed., 1, p. 69.

Type locality.—Sweden: Vesterbotten Province.

Distribution.—

GENERAL: Holarctic reaching the southern limits of its south-west Eurasian distribution in Algeria, Egypt, Iran, and Afghanistan.

AFGHANISTAN RECORDS: Barrett-Hamilton (1900, pp. 48, 49), Ellerman and Morrison-Scott (1951, p. 257). Kullman (1965, p. 12).

Third Danish Expedition, 1948-1949 (Weran Valley).

AFGHANISTAN HABITAT: Above 2,000 m. in montane biotopes.

Discussion.—

Barrett-Hamilton's identification of a weasel collected by Griffith in Afghanistan as *M. nivalis pallidus* should be viewed critically (see account of *M. erminea*, here). Within the same volume that Barrett-Hamilton describes this subspecies Lonnberg (1900, p. 436) shows that at least part of Barrett-Hamilton's subspecific determinations (with respect to weasels) are merely based on individual variation.

Paludan (Third Danish Expedition field notes of July 20, 1948) saw "Among the boulders near a small lake, 3,000 m., in the Weran Valley a stoat: rather small, yellowish-brown, tail rather short, apparently black terminally. On July 21st one of the same species was spotted in a nearby side valley (about 3,900 m) and only a few meters away; it appeared to be no larger than a weasel." This weasel could be either *nivalis* or *erminea* but is included here on the chance that small size and short tail may outweigh the blackish tip to the tail when more is known about color differences between the two species in Afghanistan.

Inclusion by Ellerman and Morrison-Scott (1951) of Afghanistan within the range of *M. nivalis* is based on two specimens, one of which was obtained 72 km. N. W. of Kabul, the other from the Shibar Pass by Chaworth-Musters.

According to Kullman (1965): ". . . report of this species [*M. nivalis*] from Afghanistan was made by Dr. Niethammer, who found its skull in the pellet of a bird of prey near Paghman (altitude 2,600 m.)."

Our expedition did not obtain any weasels nor could I find a pelt in any fur bazaar.

Vormela peregusna Guldenstaedt

Marbled Polecat

Mustela peregusna Guldenstaedt, 1770, Nov. Comm. Acad. Sci. Imp. Petrop., 14(1), p 441.

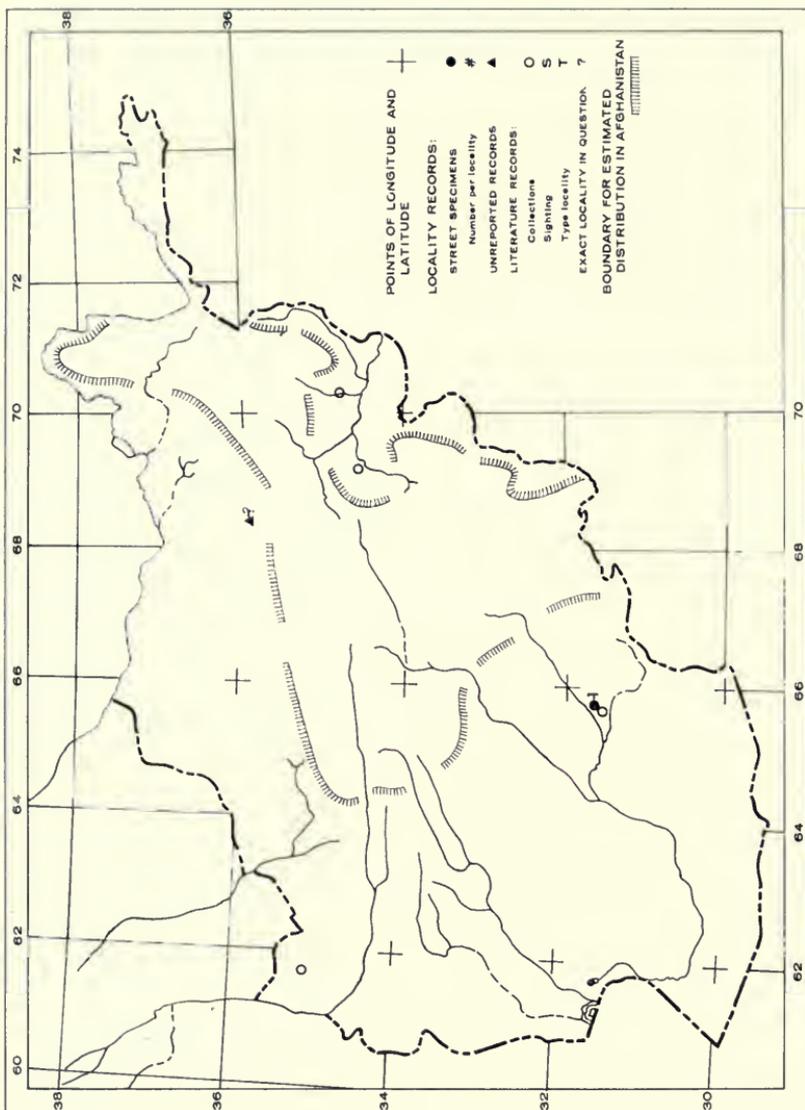


FIG. 35. Records and provisional (hence discontinuous) limits of distribution for *Vormela peregusna*.

Type locality.—Southern USSR: Banks of the river Don.

Putorius (= *Mustela*) *sarmatica* Pallas, 1771, Reise Prov. Russ. Reichs, 1, p. 453. Along the Volga River, Southern Russia.

Distribution.—

GENERAL: Rumania and east across the N. Arabian peninsula and Iranian Plateau to Mongolia.

AFGHANISTAN RECORDS: Hutton (1845, pp. 346-350), Scully (1881, p. 227), Aitchison (1889, p. 58), Selater (1891, p. 278), Akhtar (1945, p. 412), Kullman (1965, p. 12), Gaisler et al. (1968, p. 186).

Meinertzhagen (1937, FMNH 48482: Danaghor, N. Afghanistan).

1965 Street Expedition: FMNH 103964.

AFGHANISTAN HABITAT: Below 2,000 m. in montane, and steppe and semidesert biotopes, especially in the environs of the structure biotope.

Abundant (at least periodically) around Kandahar (Hutton, 1845), and rare near Kabul (Akhtar, 1945).

Discussion.—

Both Hutton (1845) and Akhtar (1945) give interesting accounts of the behavior of captive *Vormela*.

A freshly killed male measuring: HB, 330; T, 182; HF, 48; and E, 29, was purchased from a farmer near Kandahar. Skins of *Vormela* were not seen in any fur bazaars nor did we observe any while night hunting.

Martes foina Erxleben

Stone Marten

Mustela foina Erxleben, 1777, Syst. Regn. Anim., 1, p. 458.

Type locality.—Germany.

Distribution.—

GENERAL: Central and southern Europe, mountains of Russian Turkestan, Northern Arabian peninsula (Iraq, Syria, Lebanon, Israel), the Iranian Plateau and east through Kashmir, Sinkiang, Mongolia, Manchuria, and Tibet.

AFGHANISTAN RECORDS: Hutton (1845, p. 350), Selater (1891, p. 275), Pocock (1941, p. 325), Dupree (1958, p. 288), Kullman (1965, p. 12).

1965 Street Expedition: FMNH 103962.

Third Danish Expedition, 1948–1949 (Wama).

AFGHANISTAN HABITAT: The mountains and foothills above 800 m. Novikov (1956, p. 196) remarks: "In its southern range it usually inhabits mountain ravines and canyons, unforested or bush-covered slopes of mountains, reaching a height of 4,000 m." We saw a stone marten on Shibar Pass, but failed to collect it. It was seen about 10:00 PM in the watercourse /clay and loess biotope illustrated in Hassinger (1968, fig. 9). Possibly it was attracted by the numerous rodents which are here reported occupying this seepage.

Discussion.—

According to Kullman (1965): "Skins are frequently found in the Bazaar; also said to come from Badakhshan." We purchased a 'stuffed' specimen in Badakhshan. Niethammer (1967) observes that stone marten skins were fourth in order of abundance (after *Lutra lutra*, *Vulpes vulpes*, and *V. corsac* for which no order was specified) in the Kabul fur bazaar.

Martes flavigula Boddaert

Yellow-throated Marten

Martes flavigula Boddaert, 1785, Elench. Anim., 88.

Type locality.—Restricted to Nepal by Pocock (1941, p. 331).

Distribution.—

GENERAL: Eastern Siberia and in southeast Asia from the Indochinese Subregion westwards along the Himalayas to east Afghanistan.

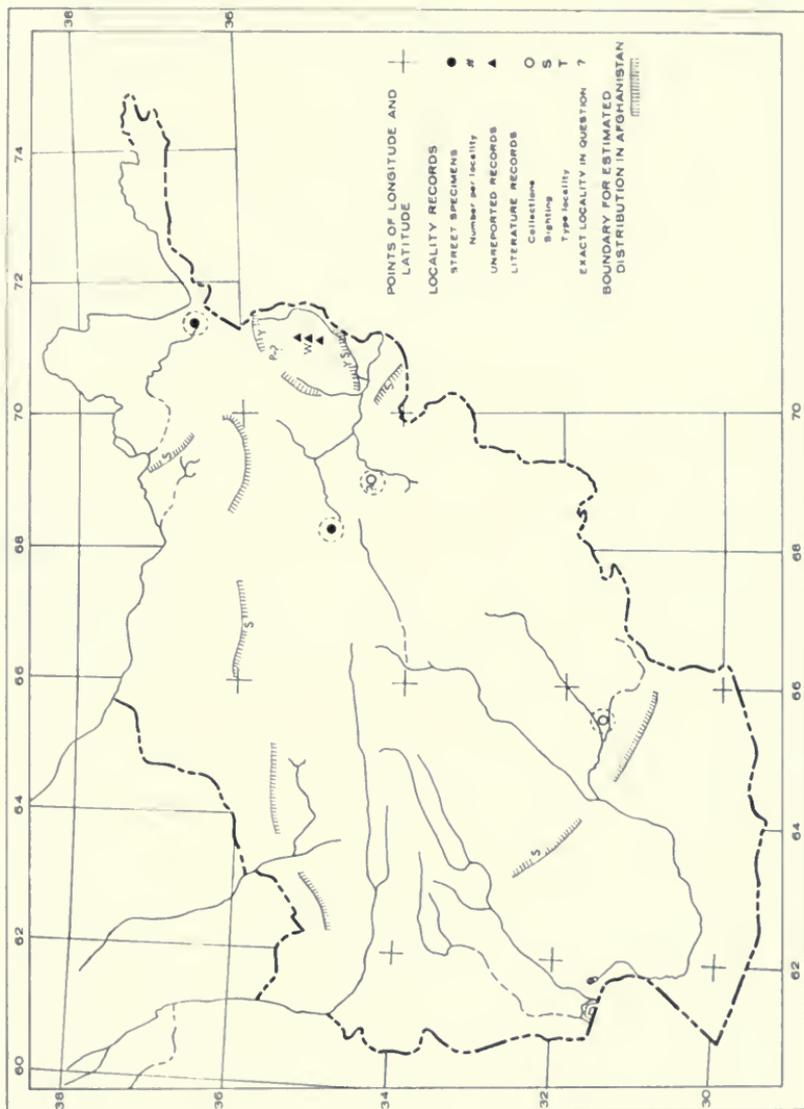
AFGHANISTAN RECORDS: 1965 Street Expedition: FMNH 103963.

Third Danish Expedition, 1948–1949 (Gusalek, Wama, and Pashki).

AFGHANISTAN HABITAT: The forests of Monsoonal Areas and Nuristan; possibly river copses in southern Badakhshan.

On May 18, 1948, Paludan (Third Danish Expedition) saw a *M. flavigula* (?)—throat yellow, hind parts of back light

FIG. 36. Records and estimated limits of distribution for *Martes foina* (S) and *Martes flavigula* (Y). Records for *foina* are circled except for Wama (W) where skins, one each, of *foina* and *flavigula* were purchased. A P-? denotes alleged Province of origin (see text, p. 138) for a *flavigula* skin purchased in Kabul.



colored, rather yellowish—in the cedar forest (2,300–3,000 m.) near Pashki. It was on the ground, and it fled along the ground. Pocock (1941, p. 336) notes, “. . . it is usually found in well wooded districts, but it is said to be fairly common in the deserts of the Northwestern Frontier Provinces [now W. Pakistan].”

Discussion.—

Our expedition purchased a single skin in Kabul that was ostensibly collected in Badakhshan, thus representing a northwestern range extension for this species. This record must be viewed critically, as Badakhshan, compared with Monsoonal Areas and Nuristan, is virtually treeless. It is, however, noted that Pashki, where Paludan saw a yellow-throated marten, is only about 30 km. from the southern boundary of the Badakhshan Natural Area.

Paludan purchased skins at Gusalek and Wama. He noted (at Gusalek, March 22, 1948): “More . . . [*M. flavigula*] skins were offered to us, so it must be rather common here.” There seems to be little reason for doubting the validity of Paludan’s observation, as skins imported from Kashmir or W. Pakistan (the heretofore western limits of distribution for *flavigula*, fide Ellerman and Morrison-Scott, 1951, p. 249) would hardly be transported to the more remote villages of Gusalek and Wama, when Kabul (the site of the largest fur bazaars) is more accessible and unquestionably the best place to sell pelts.

These records from Afghanistan represent the western limits of distribution for this species.

Mellivora capensis

Honey Badger

Viverra capensis Schreber, 1776, *Saugeth.* pl. 125, also 1777, 3, pp. 450, 588.

Type locality.—Africa: Cape of Good Hope.

Distribution.—

GENERAL: Africa, southwestern Asia north to southern Turkmen, S.S.R., east to Bengal, south to Cutch and Madras.

AFGHANISTAN RECORDS: Bobrinskii et al. (1965, p. 147).

AFGHANISTAN HABITAT: According to Novikov (1956, p. 210), the honey badger (or ratel) is found (in adjacent Turkmen) chiefly in mountains, more rarely among sand dunes, foothills, and river valleys.

Discussion.—

Although there are no reported collections of this species from Afghanistan, Bobrinskii et al. (1965) and Novikov (1956) include Afghanistan in its range. Sapozhenkov et al. (1963, p. 961) in describing the distribution of this species in Russian Turkestan, reveals that three of the distribution records are in river valleys (Hari Rud, Murghab, Amu Darya) which have their beginning in Afghanistan. There is one specimen in the British Museum of Natural History (fide Siddiqi, 1961, p. 149) from the North West Frontier Province in W. Pakistan.

From what the above distribution records reveal about its habitats, we can infer this species exists in Afghanistan, although the lack of corroborative evidence to support this inference suggests it is extremely rare.

Meles meles Linnaeus

Badger

Ursus meles Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 48.

Type locality.—Sweden: Upsala.

Distribution.—

GENERAL: Palearctic Region but absent from North Africa, and present in Southern China.

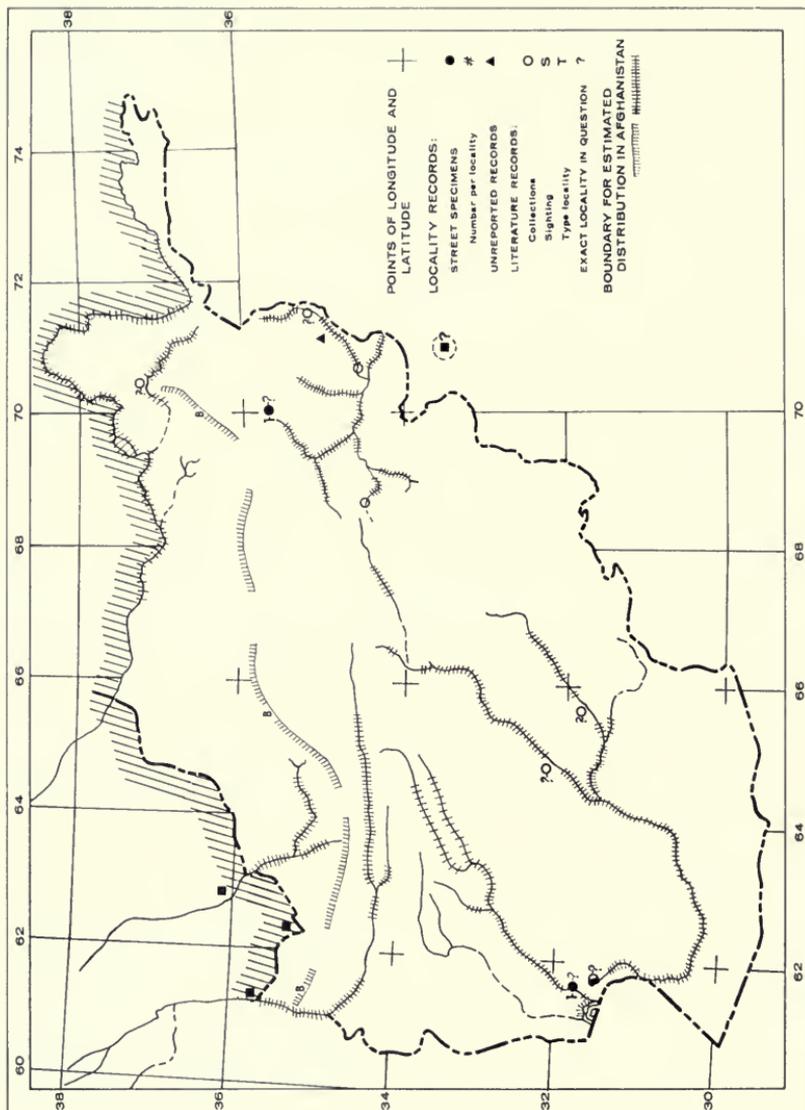
AFGHANISTAN RECORDS: Kullman (1965, p. 12), Niethammer (1967).

AFGHANISTAN HABITAT: Unknown. According to Novikov (1956, p. 213) it lives in forests, steppes, and semideserts and ascends high into the mountains, e.g., in Tian Shan from 2,500 to 3,000 m.

Discussion.—

Kullman (1965) reports: "According to their distribution in Persia, the honey badger (*Mellivora capensis*) and the common badger (*Meles meles*) probably occur in the vicinity of Maimana, but no reliable records exist. I found a skin of *Meles meles* in the bazaar in Kabul, but its exact origin could not be ascertained." Niethammer (1967) remarks, "Once we were shown a pelt of *Meles meles* said to have come from Badakhshan."

Except for 16 peripheral records in Iran (Lay, 1967, pp. 210, 235) and one in W. Pakistan (Siddiqi, 1961, p. 149), I know of no collections of either *Meles* or *Mellivora* from the Iranian Plateau proper; thus, for Afghanistan, the range of these species may be restricted to



the North and Northwest, i.e., those natural regions which form the rim of the Plateau. But, according to distribution, as illustrated by Bobrinskii et al. (1965), *Meles meles* can be found along Afghanistan's entire northern border.

Lutra lutra Linnaeus

Otter

Mustela lutra Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 45.

Type locality.—Sweden: Upsala.

Distribution.—

GENERAL: Palearctic region and the Indo-Malayan region to Java.

AFGHANISTAN RECORDS: Conolly (1840, p. 723), Hutton (1845, p. 351), Murray (1887, p. 119), Kullman (1965, p. 12), Niethammer (1967), Gaisler et al. (1968, p. 186).

1965 Street Expedition: FMNH 103965, -66.

Third Danish Expedition, 1948-1949 (Gusalek).

AFGHANISTAN HABITAT: Below 2,500 m. along perennial streams and rivers. Characteristic vegetation: notably high density and low homogeneity.

Discussion.—

According to Hutton (1845) *Lutra monticola* (= *Lutra lutra monticola*) is common along the Helmand and Arghandab Rivers. Murray (1887) purchased two skins of this species which: “. . . were said to have been got from the Helmand and Argandab rivers.”

Kullman remarks: “. . . skins are frequently found in the bazaar, stated to have been obtained in Badakhshan. I observed a pair of otters wandering over a hillside near a river in Nuristan in the winter of 1963/64 . . .” Paludan (Third Danish Expedition) purchased a skin at Gusalek in Nuristan. The Street Expedition was given a skin which was purchased on the Anjuman Pass. A second skin was purchased at Herat. The furrier said it came from the vicinity of Juwain in the Sistan.

FIG. 37. Adjacent, extralimital records for *Mellivora* (■) and range for *Meles* / / / / / (After Bobrinsky et al., 1965; Siddiqi, 1961). Lay (1967) gives no records or range for badgers in eastern Iran. In Afghanistan: conjectural limits of distribution for badgers (B); and records and estimated limits of distribution along rivers for *Lutra lutra*.

Niethammer (1967) observes, “. . . going through the fur shops [in Kabul] one may see from 20 to 40 otter skins . . . pelts are obtained regularly from Maiden-Tal valley, which lies west of Kabul. Fish are abundant in this clear water stream . . .”

Herpestes auropunctatus Hodgson Small Indian Mongoose

Mangusta auropunctatus Hodgson, 1836, Jour. Proc. Asiat. Soc. Bengal, 5, p. 235.

Mangusta pallipes Blyth, 1845, J. Asiat. Soc. Bengal, 14, p. 346. Kandahar, Afghanistan. (*Herpestes auropunctatus pallipes* fide Ellerman and Morrison-Scott, 1951, p. 295).

Type localities.—Nepal for *auropunctatus*, Kandahar for *pallipes*.

Distribution.—

GENERAL: Iranian Plateau and Iraq eastward to Hainan, south to Gujerat and Orissa (in India) and the Malay States.

AFGHANISTAN RECORDS: Blyth (*in* Hutton 1845, p. 346), Pocock (1941, p. 31), Kullman (1965, p. 12), Gaisler (1968, p. 186).

1965 Street Expedition: FMNH 103967 to 103988; skin only 103971, -77, -78, -88.

Third Danish Expedition, 1948-49 (Farah).

AFGHANISTAN HABITAT: Below 1,500 m. in the watercourse and structure biotopes. Characteristic vegetation: high density, low to high shade, two or three strata, irregular distribution and low homogeneity.

As shown in Figure 38, the Kandahar oasis supports a large number of *H. auropunctatus*.

Discussion.—

A specimen we collected in the oasis of Herat represents the northernmost occurrence of this species. Specimens have not been collected north of the Himalayas. The Kandahar oasis appear to be optimal habitat for the Small Indian Mongoose, as we obtained 20 topotypes of *H. auropunctatus pallipes* with little effort. This species is diurnal and quite bold. When the villagers were informed of our wants, they easily supplied us with 20 fresh specimens.

Average and extreme body measurements for 20 topotypes of *H. a. pallipes*: HB, 244-341 (281); T, 175-280 (252); HF, 45-57 (51); E, 19-24 (21).

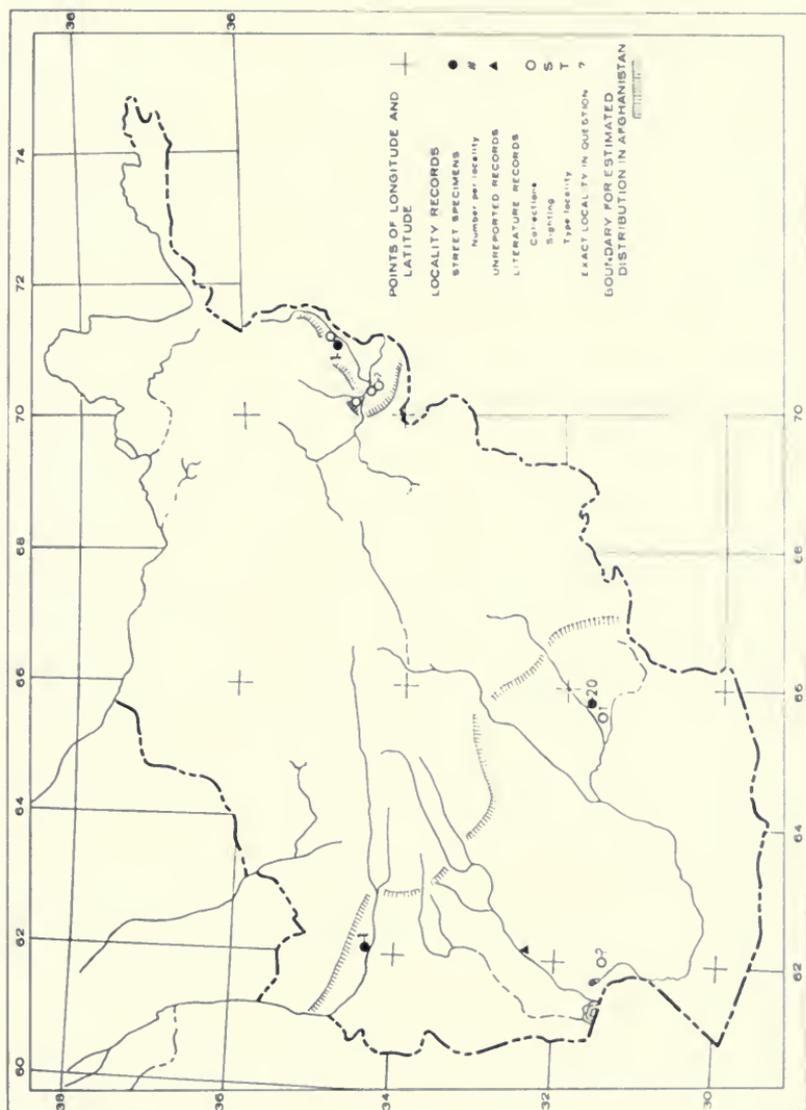


FIG. 38. Records and estimated limits of distribution for *Herpestes auropunctatus*.

Herpestes edwardsi Geoffroy Gray Indian Mongoose

Ichneumon edwardsii E. Geoffroy, 1818, Descr. Egypte, 2, p. 139.

Type locality.—"East Indies."

Distribution.—

GENERAL: Persian Gulf coast of Arabia, Iran, Baluchistan, and the Indian Faunal Sub-region to Assam and Ceylon.

AFGHANISTAN RECORDS: Blanford (1888–1891, p. 124), Pocock (1941, p. 8). These two authors include Afghanistan in the general distribution of this species, but cite no specific occurrences to support their claims. There are no known scientific collections of this species from Afghanistan.

Discussion.—

According to Kullman (1965, p. 12): "The Afghan mongoose belong to two species: *Herpestes auropunctatus* and *Herpestes edwardsi* . . .," but he concedes: "We have not yet found the latter species." Pocock (1941, pp. 14, 15) reports on skins from between Peshawar and Kashmir, and from Baluchistan, localities which are respectively east and south of Afghanistan. Lay (1967) concludes: "*H. edwardsi* seems to occur in the portion of Iran south of a line drawn from northern Khuzistan (ca. Dizful) to the city of Kerman then to the city of Zahedan." If we extrapolate, continuing this line to the east, it will run through Baluchistan and not Afghanistan. These data show the distribution of *edwardsi* to have northern and western limits which appear to approximate the southern and eastern edge of the Iranian Plateau. Probably this species will be found to have a limited distribution in Monsoonal Afghanistan and perhaps in the Jalalabad Vale, Nuristan and East Afghanistan.

Hyaena hyaena Striped Hyaena

Canis hyaena Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 40.

Type locality.—Southern Persia: Laristan: Benna Mountains.

Distribution.—

GENERAL: Northern Africa, Southwestern Asia as far north as Southern Russian Turkestan, and east to Nepal and peninsular India.

AFGHANISTAN RECORDS: Conolly (1840, p. 723), Hutton (1845, p. 345), Kullman (1965, pp. 10, 11), Gaisler et al. (1968, p. 187).

1965 Street Expedition: FMNH 103989–992, skin only 103989, complete skeleton 103990.

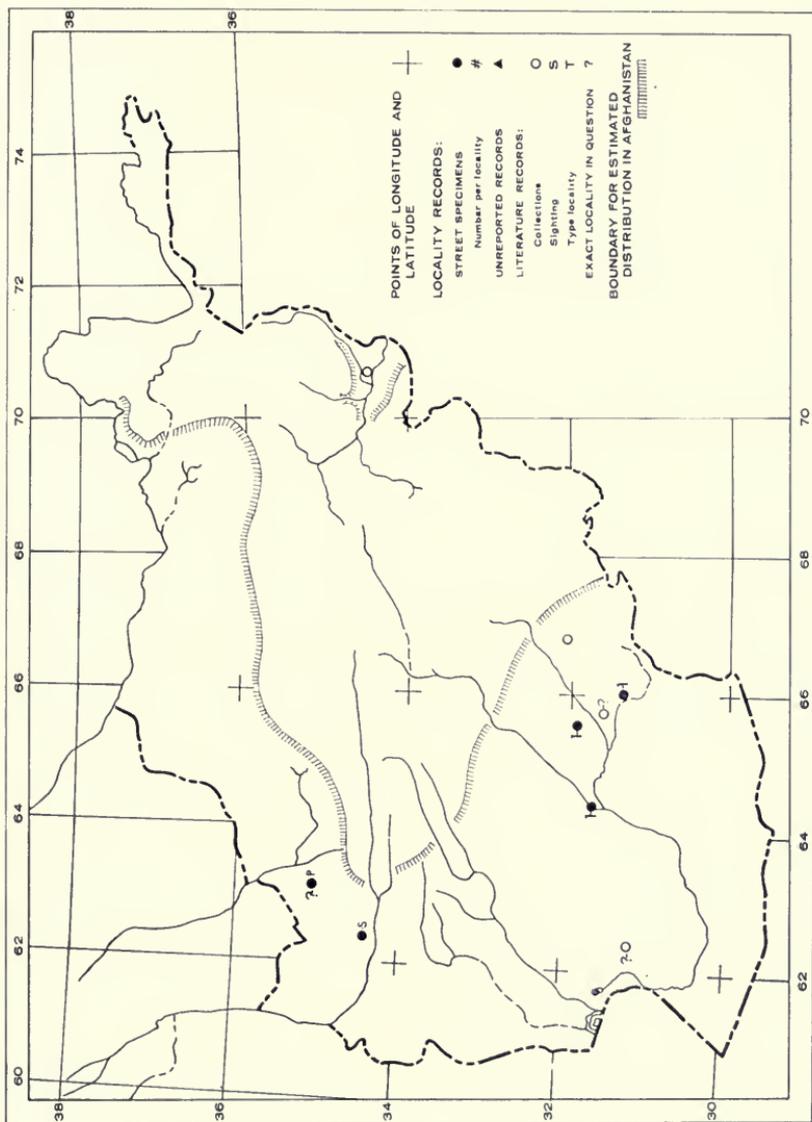


FIG. 39. Records and estimated limits of distribution for *Hygena hyaena*. Purchased skin: P.

AFGHANISTAN HABITAT: Below 1,500 m. in biotopes of steppes and semideserts, and stony foothills. Twenty-five km. north-west of Kandahar hyaenas den in small caves in a low, rock covered, east-facing hill.

Discussion.—

Kullman (1965) gives an interesting account of the hyaena in Afghanistan. He remarks hyaena hunters have the courage to enter their dark caves and overpower them there. Mr. and Mrs. Street hired several such hunters, and going to the cave mouth with them, obtained a specimen in this manner. According to the hunters, about 25 hyaenas a year are taken in this manner. Hyaenas are omnivorous. Although they are noted carrion-feeders, Kullman shows that they also feed on large tortoises (*Testudo horsfieldi*) near Kandahar, even in the winter when the torpid tortoises have to be dug out of their hibernal burrows.

In October four of us saw a large hyaena 9 km. east of Herat, but although initially within 30 m. we were unable to collect it. This observation is the first record of a hyaena this far north in Afghanistan, although we purchased a skin in Herat which was said to have come from near Qala Nau (see fig. 39), a town about 150 m. NW of Herat. As illustrated, they probably occur sporadically across North Afghanistan.

Body measurements for three hyenas are respectively: HB, 1256, 1310, 1340; T, 280, 290, 295; HF, 201, 200, 210; E, 152, 155, 160.

Felis catus Linnaeus

Domestic, Feral or Wild Cat

Felis catus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 41.

Felis silvestris Schreber, 1777, Säugeth. 3, p. 397.

Felis lybica [sic] Forster, 1780, in Buffon's Nat. Vierf. Thierre, 6, p. 313.

Felis huttoni Blyth, 1846, Jour. Asiat. Soc. Beng., 15, p. 169.

Type locality.—Sweden.

Distribution.—

GENERAL: Cosmopolitan as a synanthrope.

AFGHANISTAN RECORDS: Hutton (1845, p. 342; 1846, p. 169), Aitchison (1889, p. 57), Gaisler et al. (1968, p. 187).

1965 Street Expedition: FMNH 104005, -006; skull only 104001.

AFGHANISTAN HABITAT: Montane, steppe, and semidesert biotopes.

Discussion.—

For reasons outlined by Lay (1967, p. 215) *Felis libyca* and *F. silvestris* are here considered to be synonyms of *F. catus* Linnaeus, 1758.

Hutton (1845, p. 343) reports on: "*Felis*_____? A spotted skin of small Lynx . . . from the Huzarrah hills," and "*Felis catus*," a domestic cat: ". . . running into all sorts of varieties as to colour . . . , although the most general is a dark grey with black spots and stripes." In an addenda to Hutton's paper, Blyth (1846, p. 169) suggests Hutton's *Felis*_____? represents a new species: *F. huttoni nobis*. Subsequent authors, including Pocock (1951, p. 6), consider *F. huttoni* to be a synonym of *F. catus*. Aitchison (1889) lists *F. caudata* from Bala Morghab. The taxonomic history of this specimen, some of it incidental to general revisions of *Felis*, is interesting. This specimen is represented by a skin (BMNH 86.10.15.2) and no skull. Thomas (*in* Aitchison, 1889) named it *F. caudata*. A second tag, attached by the British Museum, has *F. ocreata caudata*, but with *ocreata* crossed off and *constantina* substituted. Pocock (1939, p. 290) considers this specimen to be *F. constantina caudata*, but later (1951, p. 128) he renames it *Felis libyca caudata*. Ognev (1935, pp. 132, 133) calls it *Felis ornata caudata* while Novikov (1956, p. 242) includes it as *Felis (Felis) ocreata*.

It should be noted that the type locality given by Ellerman and Morrison-Scott (1951, p. 305) for *F. libyca murgabensis* is: "Tachta, on River Murgab, 36° N., 63° E., Afghan-Turkestan border." Tachta-Basar or Tachta, on the River Murghab, 36° N., 63° E. is correct, but this town and these coordinates are in Turkmen, S.S.R. at least 20 km. from the border of Afghanistan.

Three feral *Felis catus* were collected by shooting, two in the rock biotope west of Shibar Pass and one on the stony steppe west of Herat. The first two are feral domestic cats, probably similar to the feral cat collected by Hutton. The third was similar to *Felis libyca* (= *catus*) *caudata* Gray as described by Pocock (1951, p. 125). Unfortunately, the skin of this third specimen was lost in transit.

***Felis chaus* Guldenstaedt**

Jungle Cat

Felis chaus Guldenstaedt, 1776, Nov. Com. Acad. Petro., 20, p. 483.

Type locality.—USSR: Terek River north of the Caucasus.

Distribution.—

GENERAL: From Egypt east through the Middle East and Southern Asia, north to Eastern Transcaucasia and the west

TABLE 16.—Body measurements of some *Felis* from Afghanistan.

(Measurements in mm.)

Species	Record	Sample	Head and body	Tail	Hind foot	Ear
<i>catus</i>	Blyth (1846) ¹	1	609	304	—	—
	1965 Street Exp.	3	397,522,480	237,268,272	111,129,131	55,46,63
<i>chaus</i>	1965 Street Exp.	6	459-639(557)	259-280(271)	145-164(151)	70-78(75)
<i>manul</i>	Pocock (1939)	1	660	284	—	—
	1965 Street ² Exp.	2	690,690	300,280	—	—

¹ Approximate measurements.

² Measurements of tanned flat skins.

coast of the Caspian Sea, parts of Russian Turkestan to Sinkiang, Yunnan, and Vietnam; south to Ceylon.

AFGHANISTAN RECORDS: Hutton (1845, p. 342), Scully (1887, p. 69), Selater (1891, p. 228), Kullman (1965, p. 7), Ishunin (1965, p. 632), Niethammer (1966, p. 393).

1965 Street Expedition: FMNH 103994-104000.

AFGHANISTAN HABITAT: Below 1,000 m. in the watercourse and structure biotopes. Characteristic vegetation; high density and low homogeneity.

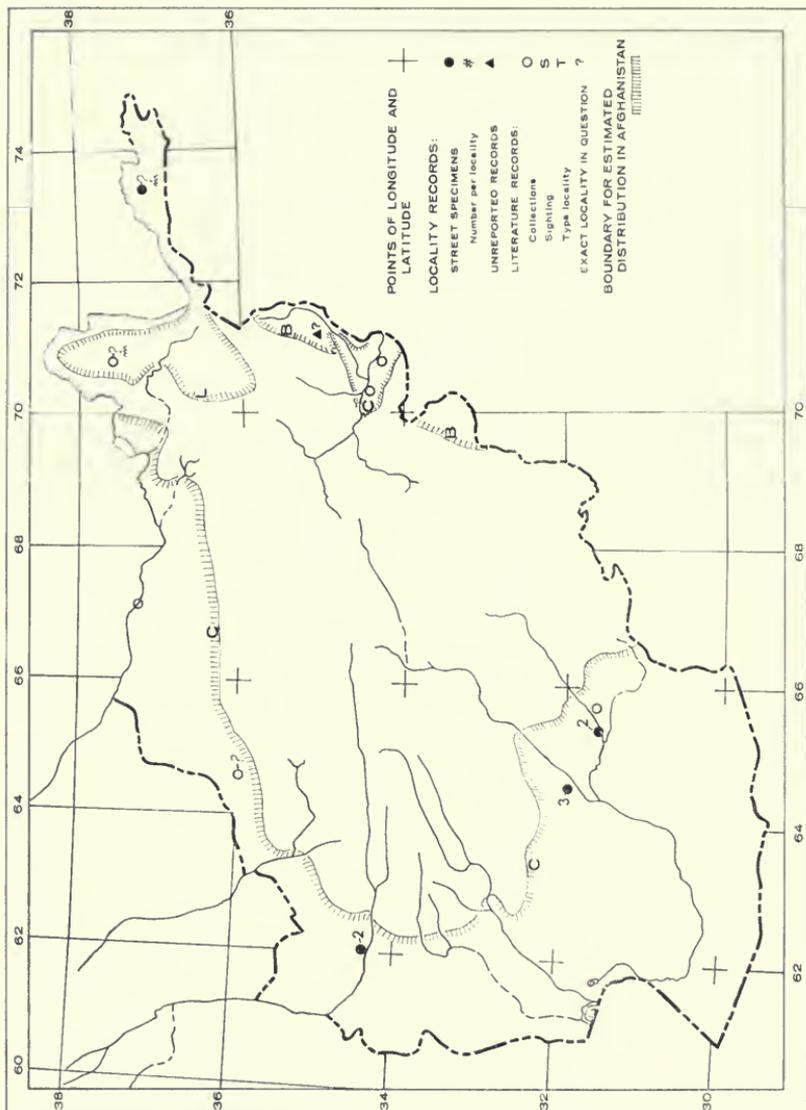
Taxonomic Notes and Discussion.—

Scully (1887, p. 69) describes *Felis caudata* Gray from Maimana as: "A flat skin, without skull. Nose to insertion of tail about 29.5 inches [751 mm], tail about 13 [332], hairs at tip of tail 0.7 [18], ear from orifice at front 2.2 [56], longest whisker 3.5 [89], palma 3.2 [81], planta 1.4 [36]." He admits: ". . . from want of specimens for comparison, and in the absence of the skull, I cannot feel certain that the identification is correct."

Zukowsky (1914, p. 139), on the basis of Scully's data, which includes a brief description of the pelage, considers this specimen to be: "*Felis (Felis) maimanah* spec. nov." Subsequently Ognev (1935, p. 144), acknowledged Zukowsky's decision and concluded: "To establish the precise taxonomic position of this form more material would be needed," but Ellerman and Morrison-Scott (1951, p. 307) and Novikov (1956, p. 248) tentatively consider this specimen to be *Felis chaus*. Certainly more material would be desirable, however, by process of elimination we are left with *Felis chaus*, as the only other candidate is *Felis catus libyca* which never has a head and body as long as 751 mm. According to Zukowsky, *F. maimanah* is distinguished by a very large body and a tail which is short by comparison. This specimen is large, but Scully's figures should not be accepted uncritically. In any event, Pocock (1951, p. 162), in his account of *Felis chaus affinis* (a subspecies ranging from Kashmir to ?Assam), reports on a specimen having a head and body 721 mm. and tail 335 mm. The pelage of this subspecies is also similar to the pelage of the specimen described by Scully, thus, disregarding subspecific differences, Scully's specimen must be considered *Felis chaus* until additional information proves otherwise.

Field Notes and Discussion.—

We trapped our first specimen, a large female, in thick foliage along the Hari Rud (river) near Herat, attracting it with fresh



Meriones carcasses. Its stomach contained numerous *Mus* which was not surprising to us, for our smaller mammal trapping suggested that *Mus* was the most abundant rodent along the river. Subsequently, in October and November we shot five specimens while night hunting, one in the Hari Rud river bottom and four in the Helmand drainage. We also purchased a live kitten which had been captured in October near Kandahar. It greedily devoured numerous *Mus*, but was soon added to the collection of study specimens.

Felis manul Pallas

Manul Cat

Felis manul Pallas, 1776, Reis. Russ. Reichs, 3, p. 692.

Type locality.—Buryat Mongol ASSR: Dschida River south of Lake Baikal.

Distribution.

GENERAL: Central Asia, from Transeaucasia eastward to Mongolia, Kansu, and Szechuan; north into Turkmen and Transbaikalia; south through the Iranian Plateau also to Baluchistan, Kashmir, and Tibet.

AFGHANISTAN RECORDS: Pocock (1939, p. 320).

1965 Street Expedition: skins only, FMNH 104003, -004.

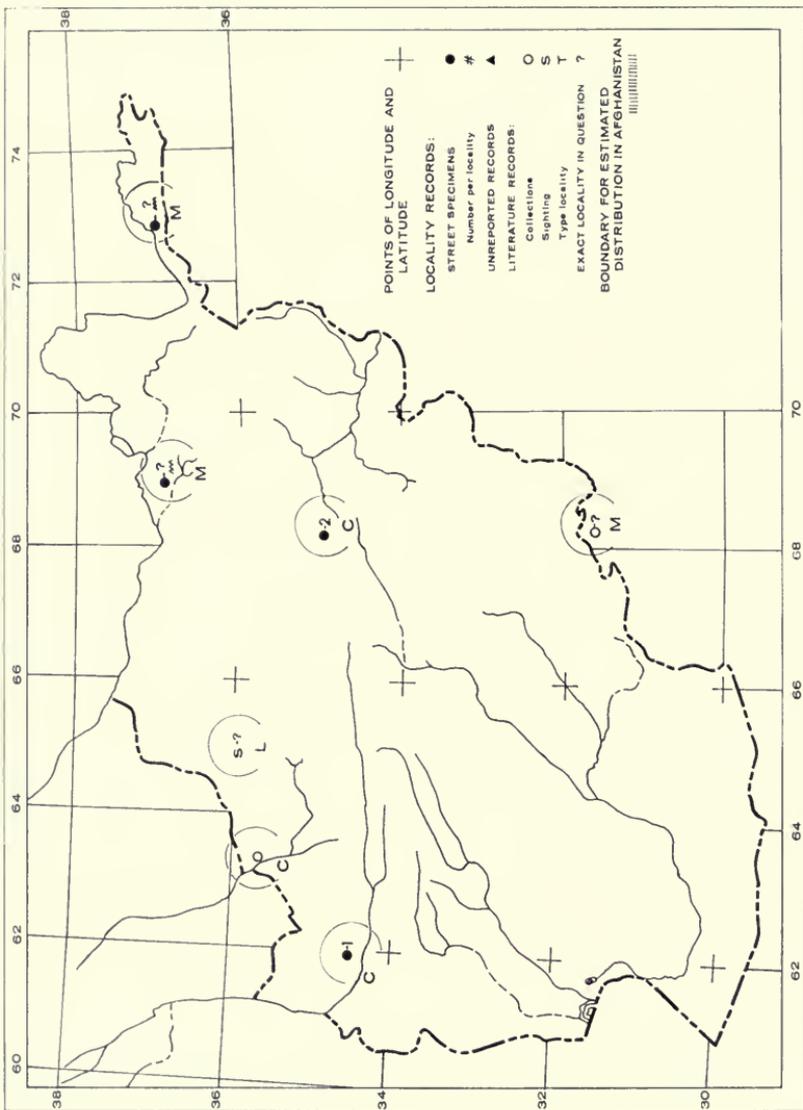
Third Danish Expedition, 1948-1949 (skin purchased in Kabul). Niethammer, (1968, *in litt.*, Central Afghanistan and Panjir Valley).

AFGHANISTAN HABITAT: Dry stony plateaus and mountains. According to Novikov (1956, pp. 262-263): "Inhabits steppes and deserts, preferring stony plateaus and treeless rocky mountain slopes. Sometimes ascends high in mountains (to 3,000 m.)."

Discussion.—

Pocock (1939) reports on a specimen collected by Col. Wilson from the Toba Plateau, on the south Afghan-Baluchi border. The remaining records are of skins purchased in fur bazaars or from natives. Skins purchased by the Street Expedition, one from Mazar-

FIG. 40. The records and estimated limits of distribution for *Felis chaus* (C), *F. bengalensis* (B), and *Lynx lynx* (L) in Afghanistan. The underlined question marks illustrate the alleged-province-of-origin of skins purchased in the Kabul and Herat fur bazaars.



i-Sharif and one from Herat were said to have been collected near Kunduz and in the Wakhan.

Felis bengalensis Kerr

Leopard Cat

Felis bengalensis Kerr, 1792, Anim. Kingd., 151.

Type locality.—Nepal.

Distribution.—

GENERAL: Baluchistan, the Indian Faunal Region, China, and southeastern Russia.

AFGHANISTAN RECORDS: Third Danish Expedition, 1948–1949 (purchased, Nuristan).

AFGHANISTAN HABITAT: Monsoonal Afghanistan.

Discussion.—

A single skin was purchased by the Third Danish Expedition. This skin represents the northwestern most distribution record for this species and is the first record from Afghanistan. According to Kullman (1965, p. 9), *Felis bengalensis* was previously known from Afghanistan, however, he offers no documentation of this assertion. Kullman quotes literature records mainly from Ellerman and Morrison-Scott (1951), but there are no records which are referred to Afghanistan in that checklist.

The arid climate and sparse vegetation of dry Afghanistan undoubtedly limits this species to Monsoonal biotopes where it is obviously a rare (although not unexpected) habitat or perhaps visitor.

Felis pardus Linnaeus

Leopard

Felis pardus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 41.

Type locality.—Egypt.

Distribution.—

GENERAL: According to Pocock (1939, p. 222): "The whole of Asia south and east of a line running roughly from Asia Minor

FIG. 41. Distribution records for *Felis catus* (C), *F. manul* (M), and *Lynx caracal* (L) in Afghanistan. *Felis catus* will probably be found throughout Afghanistan in suitable habitat. Distribution limits for *F. manul* and *L. caracal* are not estimated because there are few reliable records and their habitat preference has not been sufficiently studied. The underlined question marks illustrate the alleged-Province-of-origin of skins purchased in the Kabul and Herat fur bazaars.

and the Caucasus to Manchuria and Amurland, and reaching Kangean Island to the east of Java; also practically the whole of Africa except the Sahara."

AFGHANISTAN RECORDS: Hutton (1845, p. 342), Kullman (1965, p. 6).

AFGHANISTAN HABITAT: Probably above 1,500 m. in montane biotopes. According to Novikov (1956, p. 272): "Inhabits chiefly inaccessible mountain forests with cliffs, ravines and mountain streams, impassable thickets, at a height of 1,000 to 1,500 m. and up to 3,500 m."

Discussion.—

Hutton (1845) reports: "This animal [*Felis leopardus*] is common in the mountainous parts of Afghanistan, and is destructive to flocks and cattle . . ." Blyth (in Hutton, 1845, p. 342) notes: "A Candahar specimen forwarded by Captain Hutton is of moderate dimensions, with rather long fur, very pale in colour, and the spots a good deal ringed, including those along the back line." Kullman (1965) reports on a "true leopard" (*Felis pardus*) from the Lataband Pass and on a further specimen of the subspecies *Felis pardus saxicolor* from Nuristan, which he describes as having characters intermediate between the true leopard and the snow leopard. He maintains that up to the time of his paper specimens of this subspecies are known from Persia only." Kullman was not aware of Hutton's record, which according to Blyth's description probably also belongs to this subspecies.

NOTE: Kullman thinks *F. pardus saxicolor* resembles *Felis unci*a more than *pardus*, and that ". . . it should therefore be properly named '*Felis unci*a *saxicolor*,'" but he presents no evidence to support his argument.

The following comments are from Kullman (1965, p. 7): "The main prey of the leopard in Afghanistan [is] apparently wild goats and sheep. They seem to hunt other carnivores as well, perhaps wolves, as the leopard from the Lataband Pass was infected with *Trichinella spiralis*, and Trichinellosis is found in Afghanistan only in carnivores, according to our examinations. Leopards apparently cause a lot of damage among domestic animals in several provinces. On our last expedition in July of this year, in the Pesch Valley, we ascended to a mixed oak-cedar forest, at an altitude of 2,000 m., where we twice found fresh leopard tracks. During the night, 5 sheep . . . were missing. The remains of one animal were found the

next day, but no trace of the others. We also found the skull of a cow which had been recently killed."

Felis tigris Linnaeus

Tiger

Felis tigris Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 41.

Type locality.—Bengal.

Distribution.—

GENERAL: According to Pocock (1931, p. 197): "Practically the whole of Asia, in suitable localities, eastward of a line from the Caucasian area and Afghanistan to Manchuria and Korea, but omitting the Tibetan Plateau, most of India, and extending from Burma and the Malay Peninsula through the Sunda Islands to Bali, east of Java, but not found in Ceylon."

AFGHANISTAN RECORDS: Elphinstone (1842, p. 187), Blyth (*in* Hutton, 1845, p. 341), Aitchison (1889, pp. 55, 56), Ognev (1935, pp. 290, 292).

AFGHANISTAN HABITAT: Remote areas in the watercourse biotope.

Discussion.—

Elphinstone (1842) writes: "Tigers are found in most of the countries east of the range of Solimaun, and it is there that leopards are most common. They are, however, to be met with in most of the woody parts of Afghanistan." Blyth (*in* Hutton, 1845) notes: ". . . Mr. Vigne remarks that the Tiger is 'said to be well known' upon the Sufyd koh mountain." Aitchison (1889) offers the following account: "On the 19th January, 1885, at our camp at Bala-morghab the body of a female tiger was brought to the General . . . It was evidently an old animal, the teeth being broken and much worn away. It measured 8 feet 4 $\frac{3}{4}$ inches from the tip of the nose to the end of the tail, the tail alone measuring 36 inches and from the spine above the shoulder to the base of the second claw on the forefoot measured 3 feet 8 inches . . . It was killed near Karaol-khana, between that and Mara-chak on the Bala-morghab river . . . On the 5th May, at the Chashma-sabz pass, at an elevation of 5,000 feet, I came across the playground evidently of a pair of fine animals, which, from the very recent condition of their pugs, must have been close in our neighborhood." Ognev (1935, pp. 290, 292) cites records of tigers from the proximity of the Afghan border in the regions of Bala-Murghab and the Upper Amu Darya (Pryandzh) river. The

most recent record from the Afghan-Russian border region, as shown by Ognev, is around 1924.

It is possible that a few tigers still exist in the more remote river valleys of northern Afghanistan, but it is almost a certainty that tigers no longer exist in Monsoonal Afghanistan (indeed if they ever did. Elphinstone's and Vigne's comments are not based upon specimens, but upon generalizations and second-hand information).

Felis uncia Schreber

Snow Leopard

Felis uncia Schreber, 1776, *Saugethier*, 3, pl. 100 (1776), text 386, 586 (1777).

Type locality.—Fixed by Pocock (1930, p. 332) as the Altai Mountains [Mongolian Peoples Republic and Sinkiang and Kansu provinces of China].

Distribution.—

GENERAL: According to Pocock (1939, p. 240): Central Asia, the Altai, and Tibet; India, from Kashmir to the eastern end of the Himalayas.

AFGHANISTAN RECORDS: Kullman (1965), Gaisler et al. (1968, p. 187).

1965 Street Expedition: skin only, FMNH 104007.

AFGHANISTAN HABITAT: This species is only known from skins purchased in the Kabul fur bazaar. Its habitat on the Himalayan Mountains is reported by Pocock (1939, p. 242): “. . . on rocky hill sides above the tree line at altitudes as low as 6,000 ft. in winter and as high as 12,000 or 13,000 ft. in summer.”

Discussion.—

Kullman (1965) says the snow leopard lives in the Wakhan and in Badakhshan at high altitudes, but is known only from skins in the Kabul bazaar. I saw three snow leopard skins in this bazaar, but only purchased one. The furriers were unanimous in ascribing

FIG. 42. The records and estimated limits of distribution for *Felis tigris* (T), *F. uncia* (U), and *F. pardus* (P) in Afghanistan. Only locality records (one in Iran) are given for *Acinonyx* (A). An underlined question mark illustrates either the alleged-province-of-origin of a skin purchased in the Kabul fur bazaar or the most probable natural area wherein an insufficiently documented literature record might have been collected. For example: Blyth (in Hutton, 1945, p. 342) reports: “A Candahar [c.f.* on map] specimen [of *Felis pardus*] forwarded by Captain Hutton . . .” This leopard was probably brought to Kandahar from the mountains, as Hutton (*ibid*) notes: “This animal [*F. pardus*] is common in the mountains of Afghanistan, . . .”

Badakhshan as the region wherein these snow leopards were captured. In 1966, Gaisler et al. (1968) purchased a skin which, according to the merchant, came from Nuristan. The natural areas of Nuristan and Badakhshan share a common boundary along the crest of the Hindu Kush.

Lynx lynx Linnaeus

Lynx

Felis lynx Linnaeus, 1778, Syst. Nat., 10th ed., 1, p. 43.

Type locality.—Sweden: near Upsala.

Distribution.—

GENERAL: After Pocock (1939, p. 310): "Europe, and Northern Asia to the limit of tree growth, Central Asia as far south as about lat. 30° N. . . ."

AFGHANISTAN RECORDS: Kullman (1965, p. 9).

1965 Street Expedition: skin only, FMNH 104002.

AFGHANISTAN HABITAT: Data from the Himalayas east of Afghanistan presented by Pocock (1939, pp. 313, 314) suggests that it lives above 2,500 m. in densely vegetated habitat in the watercourse/rock biotope.

Discussion.—

Kullman (1965) reports on: ". . . a skin from the Bazaar in the Zoological Institute which probably came from Badakhshan." We purchased a skin in Herat which the furrier said was brought from the Wakhan.

The lynx is found in Iran, the Pamirs, Kashmir, and, according to Ognev (1935, p. 215), ". . . perhaps across the northern part of Afghanistan." The above records in part support Ognev's suggestion as the lynx may visit or live in northeastern Afghaistan, but the dry, sparsely vegetated nature of the terrain in North and Northwest Afghanistan undoubtedly excludes it from the remainder of "the northern part of Afghanistan."

Lynx caracal Schreber

Caracal Lynx

Felis caracal Schreber, 1776, Säugeth., pl. 110, text 3, pp. 413, 587, 1777.

Type locality.—South Africa: Capetown: Table Mountain.

Distribution.—

GENERAL: Africa; Syria east through Iraq, Iran, Turkmenia to Punjab; south in Asia to Aden, Baluchistan, Cutch, and United Provinces, India.

AFGHANISTAN RECORDS: Ognev (1935, pp. 194, 195). Novikov (1956, pp. 258-259), Bobrinski et al. (1965, p. 141), Kullman (1965, p. 8).

AFGHANISTAN HABITAT: Steppe, semidesert, and dry montane biotopes.

Discussion.—

In the first three of the four above citations of publications Afghanistan is included in a general statement on distribution. Those records are not based on a verifiable collection of this species within Afghanistan. Kullman (1965) remarks: “. . . the Caracal (*Felis caracal*), occurs in the dry regions around Maimana and Shibargan, probably also in the Seistan.” He offers no evidence to support this statement.

The caracal has been collected in the Hari Rud, Murghab, and Amu Darya river valleys in Russian Turkestan. These rivers have their origins and much of their lengths in Afghanistan. Specimens have also been collected west (see Lay, 1967) and south (see Murray, 1887, p. 118) of Afghanistan. Although rare, there can be little doubt that *Lynx caracal* occurs in Afghanistan.

Acinonyx jubatus Schreber

Cheetah

Felis jubata Schreber, 1776, *Saugeth.*, 3, pl. 105 (1776), text, 302, 586 (1777).

Type locality.—South Africa: Cape of Good Hope.

Distribution.—

GENERAL: Southwest Asia and Africa; rare or extinct in central and northern India, W. Pakistan, and Afghanistan.

AFGHANISTAN RECORDS: Aitchison (1889, p. 57).

Third Danish Expedition, 1948-1949 (skin purchased at Farah).

AFGHANISTAN HABITAT: Ancillary evidence from Iran (Lay, 1967) and Turkmenia (Novikov, 1956, p. 280) suggest it will be found in large river basins in the clay-and-loess, and sand biotope below 1,000 m.

Discussion.—

This species is rare or extinct in Afghanistan. According to Aitchison (1889): “A pair of young Hunting Leopards were obtained by Peter Lumsden’s party in their journey through Persia towards Afghanistan, in the watershed of the Hari-rud river, on the southern

slopes of the mountains that separate the waters of Zroabad from those of the Turbat-shaikh-jami river." This locality is close to Afghanistan but in Iran. Ognev (1935, p. 314) lists cheetahs from three drainages which have their source in northern Afghanistan. The most recent of Ognev's citations is 1932, around which time three were seen in the Murghab Basin. The only known record from Afghanistan is a dry, untanned skin purchased by Paludan at Farah. This town is in the Helmand Basin with many wild desert areas, and gazelles (a major food of *Acinonyx*). If cheetahs exist anywhere in Afghanistan, it is probably in these basins.

Order PERISSODACTYLA

Equus hemionus Pallas

Wild Ass

Equus hemionus Pallas, 1775, Nov. Comm. Acad. Sci. Petrop., 19, p. 394, pl. 7.

Type locality.— U.S.S.R.: Transbaikalia (50° N, 115° E).

Asinus hemionus onager Boddaert, 1785

Persian Wild Ass

Equus onager Boddaert, 1785, Elenchus Animalum, 1, p. 160. "Mountains about Kasbin": more likely the desert south of Kasbin (Qazvin).

Asinus hemionus kulan Groves and Mazák

Transcaspiian Wild Ass

Asinus hemionus kulan Groves and Mazák, 1967, Z. Saugetier., 32(6), pp. 343-345.

Badkhyz Reserve, Turkmenia, U.S.S.R. (ca. 35° 50' N, 61° 40' E).

Distribution.—

GENERAL: Southern and Eastern Russian Turkestan, Mongolia, Sinkiang, Tibet, the Iranian Plateau, and northern India. (Range formerly extended to the Syrian Desert.)

AFGHANISTAN RECORDS: Babur in the sixteenth century A.D. (Memoirs translated and published in 1921, p. 246), Conolly (1840, p. 723), Hutton (1846, p. 145), Aitchison (1889, pp. 61, 62), Groves and Mazák (1967).

AFGHANISTAN HABITAT: Steppe and semidesert biotopes.

Discussion.—

Groves and Mazák (1967) suggest that in Afghanistan the Persian Wild Ass is separated from the Transcaspiian Wild Ass by the

FIG. 43. Records and estimated distribution in river valleys and reed swamps for *Sus scrofa* (S'). Circled question marks denote general localities of past occurrence for *Equus hemionus*. Aitchison's (1889) sightings are labeled A, as is the boundary for possible current distribution.

westernmost chains of the Hindu Kush. It should be noted that these . . . chains present no barrier, as the Hari Rud valley (where Aitchison, 1889, saw over 1,000 wild asses, see below) cuts a passage through the westernmost chains of the Hindu Kush. If the Hari Rud valley were used, a wild ass traveling from the Transcaspiian depression (range given for *E. h. kulan*) to the Sistan or Iranian Basins (included in range for *E. h. onager*) would seldom have to cross a ridge as high as 1,000 m. Groves and Mazák admit possible sub-specific intergradation along the Iran and Turkmenistan border: “. . . as the Elburz range in that area is low and would act as a poor barrier to gene flow.” I suggest that the wide valleys along the border shared by Afghanistan and Iran, rather than the higher Elburz range, would be a more likely course of gene flow for intergradation.

According to the translation of Babur's (1921) memoirs, the wild ass (ssp.?) was found near Ghazni, and near the Surkhāb, a river which rises in the Sefid-koh, and joins the Kabul river. Conolly (1840) remarks: “Wild asses [*E. hemionus onager*] . . . abound in the desert between the Helmund and the Bandau hills.” These hills are near the Afghan-Iran border but in Iran. Hutton (1846) says: “The Gorkhur, or wild Ass, I never saw, but it occurs in the southern deserts . . . also in the neighborhood of Herat and in Persia.” Aitchison (1889) gives the following account of *E. hemionus kulan*: “In my march from Gal-i-cha to the base of the Kambao Pass, on the 20th of April, 1885, I had to cross the northern end of a great plain called “*Gulam-i-maidan*,” or the plain of the Wild Ass [approximately 35.00 N, 61.15 E] . . . My guide took me to a slight elevation, and from it pointed out to me where I was to look for the animals: for some time I could see nothing; at last, whilst using my glasses, I noticed clouds of dust . . . these several lines of dust-cloud were caused by herds of Asses, galloping in various directions over the great plain. One herd came well within a mile's distance; from its extent, I am even now of the opinion which I then held, that the herd consisted of at least a thousand animals. I counted sixteen of these lines of dust-cloud at one time on the horizon.”

These records show that the wild ass was numerous and widespread in the past. The only recent Afghan record of this species of which I am aware is that they might persist near Kushka at the Turkmenistan border north of Herat, as Ellerman and Morrison-Scott (1951, p. 341) list it, “now surviving round Kushka.”

From the literature, I know of no study specimens of a wild ass from Afghanistan in a museum collection.

Order ARTIODACTYLA

Sus scrofa Linnaeus

Wild Hog

Sus scrofa Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 49.

Type locality.—Germany.

Distribution.—

GENERAL: Palearctic Faunal Region and Indian Faunal Sub-region, but not found above 60° N latitude.

AFGHANISTAN RECORDS: Conolly (1840, p. 719), Hutton (1846, p. 135), Aitchison (1889, p. 62), Dupree (1958, p. 288), Kullman (1965, p. 15).

Third Danish Expedition, 1948-1949 (Farah Rud).

AFGHANISTAN HABITAT: Major river valleys in the watercourse biotope; persisting today in dense, reed swamps.

Discussion.—

Kullman (1965) writes: "Ten years ago they [*Sus*] were still numerous in the marshy districts near Pul-i-Khumri. After drainage of large areas for agricultural purposes, their number decreased; considerably, also because they were hunted by Europeans for many years. This species is reported to be still numerous in Seistan, Kataghan, Paktia [Part of East and Monsoonal Afghanistan], Badakhshan and Nuristan. Wild boars invade the fields and cause serious damage during the harvest."

Paludan's field notes from the Third Danish Expedition provide a record of this species collected along the Farah Rud, which is supported by a skull. Dupree (1958) reports on bones (fragmentary remains of ten *Sus scrofa*) excavated from Shamshir Ghar, a cave near Kandahar.

Lay (1965) collected five pigs 24-32 km. southwest of Zabol in the Sistan Basin (Helmand Delta). During November, 1965 when we were encamped on this delta (see fig. 24, locality 15, in Hassinger, 1968) we never saw a pig but heard them squealing in the reed swamps.

Cervus elaphus Linnaeus

Red Deer; Stag

Cervus elaphus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 67.

Type locality.—Southern Sweden.

Distribution.—

GENERAL: The Palearctic Faunal Region, eastwards to Manchuria and eastern Siberia, south to the Yangtze, and into the Indian Faunal Subregion along the southern slopes of the Himalayas; Algeria and Tunis, where rare. North America.

AFGHANISTAN RECORDS: Scully (1887, p. 76), Aitchison (1889, p. 65), Flerov (1952, pp. 151, 168–169), Kullman (1965, p. 15; 1966/67, p. 133), Bobrinskii et al. (1965, pp. 217, 218, map 60).

Third Danish Expedition, 1948–1949 (grave with two antlers between Jurm and Faizabad). Flerov (1952) noted the red deer was found along the Kukche (=Kokcha) River but not beyond 10 km. from its confluence with the Amu Darya; in the Kunduz River valley from Khanabad to the Amu Darya; and along the Balkh River. It is not known whether deer are found along these rivers today, but is unlikely that the Balkh River, which is completely consumed in irrigation of the land, supports any deer today.

AFGHANISTAN HABITAT: Dense vegetation along the Amu Darya. According to Flerov (1952): “. . . the bukharian [=stag] deer is encountered in hilly regions. It inhabits only a narrow strip of dense vegetation along rivers and never goes higher than places where the rivers emerge from the mountain chasms.”

Discussion.—

Scully (1887) reports on a left antler of *Cervus cashmirianus* (= *C. elaphus*) from the banks of the Oxus (Amu Darya) near Balkh. Aitchison (1889) noticed a pair of *Cervus maral* (= *C. elaphus maral*) horns on a shrine north of Herat.

Kullman (1965) notes: “Cervidae seem to be represented in Afghanistan only by a few individuals of one species. The red deer (*Cervus elaphus*) in North Afghanistan is the only species reliably recorded (on the banks of Amu Darya, east of Kunduz.)” In 1965 I saw a live *C. elaphus* from this area, confined in a cage at the Institute of Zoology and Parasitology in Kabul. Kullman (1966–67, p. 133) shows a photograph of this captive stag.

Along the Amu Darya (see fig. 44), Bobrinskii et al. (1965, pp. 217, 218, map 60) show distribution for subspecies *Cervus elaphus bactrianus* Lydekker.

Moschus moschiferus Linnaeus

Musk Deer

Moschus moschiferus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 66.

Type locality.—"Tartary, approaching China."

Distribution.—

GENERAL: From Monsoonal Areas in Afghanistan eastwards along the southern flanks of the Himalayas to northern Burma, and below 70° N latitude in the Palearctic faunal region from the Altai mountains and Yenesei River and eastwards to the Pacific Ocean.

AFGHANISTAN RECORDS: Raverty (1859)—for Kafiristan (=Nuristan).

Third Danish Expedition, 1948-1949 (Pashki).

AFGHANISTAN HABITAT: Coniferous forests in Monsoonal Areas.

Discussion.—

On May 13, 1948, in the Parun Valley near Pashki, Paludan (Third Danish Expedition) observed, ". . . an animal about the size of a roe deer, greyish like a roe in winter, but the hindquarters were not snow white; head small, narrow; antler or horn not seen." On May 21, Paludan questioned the Malik (=chief) of Kustaki (a small village north of Pashki in the Parun Valley at 2,375 m. elevation), showing him pictures of animals in Sterndale's *Mammalia of India*. The musk deer was identified as being common. The Malik spontaneously mentioned the musk-glands and that the "tusks" are only found in males. Subsequently, Paludan saw another deer like the one he had seen previously and noted, "Yesterday the Malik confirmed a suspicion I have entertained since seeing the first deer; the animals I have seen are Musk deer."

Gazella subgutturosa

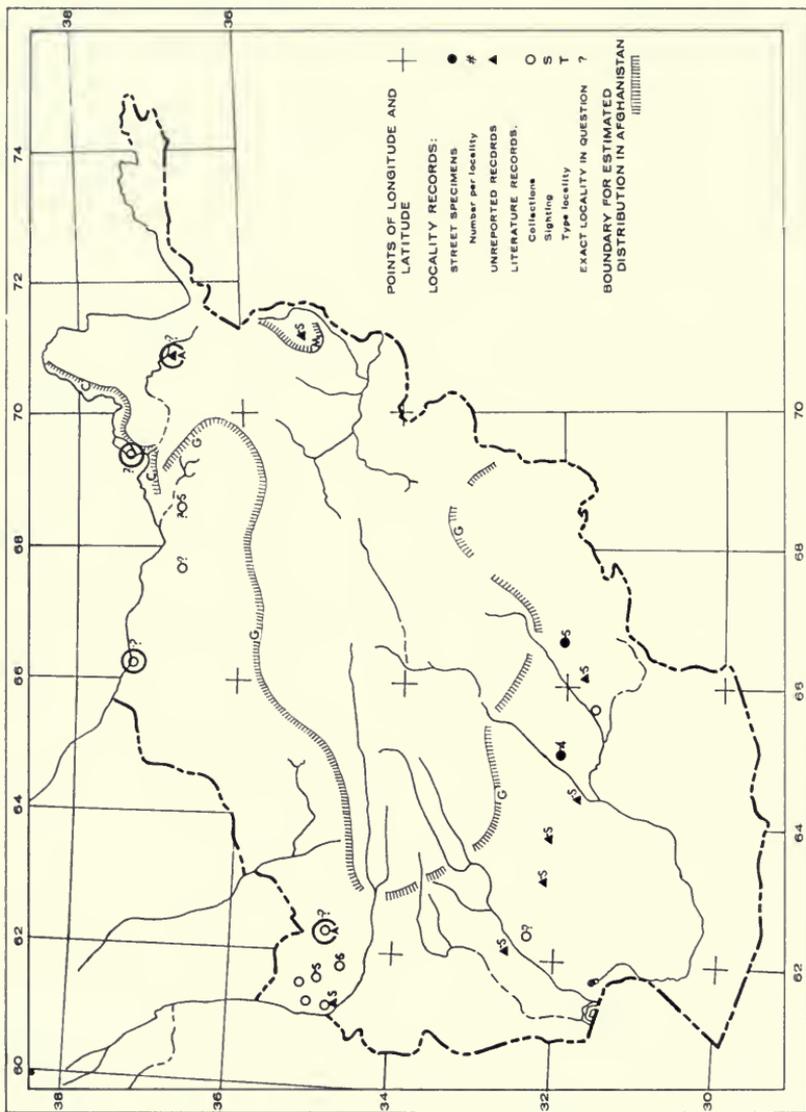
Goitered Gazelle

Antilope subgutturosa Guldenstaedt, 1780, Act. Acad. Sci. Petrop., 1778, 1, p. 251.

Type locality.—Northwestern Persia.

Distribution.—

GENERAL: Arabian peninsula, Transcaucasia, Euphrates Valley, Iranian Plateau, Russian Turkestan, Mongolia, Tibet, and Sinkiang.



AFGHANISTAN RECORDS: Hutton (1846, p. 151), Wood (1872, p. 268), Scully (1887, p. 76), Aitchison (1889, p. 64), Selater (1891, p. 161), Kullman (1965, p. 14).

1965 Street Expedition: FMNH 104008-011.

Third Danish Expedition, 1948-1949 (field observations: 72 km. W. of Girishk, 25 km. W. of Dilaram, ca. 10 km. S. of Girishk, 50 km. NW of Kandahar, N. of Farah, between Tirpul and Islam Qala).

AFGHANISTAN HABITAT: Below 2,000 m. in the steppe and semidesert. Common in the clay-and-loess biotope and on stony, alluvial fans.

Discussion.—

Hutton (1846) and Aitchison (1889) attest to the abundance of this species in the semideserts from Quetta (W. Pakistan) and Kandahar to Herat. Aitchison mentions a 'drive' near Herat which resulted in the coalescence of a number of small (four or five) bands of gazelles, thus: ". . . several members of the Mission told me [Aitchison] that they had seen herds numbering hundreds of individuals. . . ."

I saw young, captive gazelles at the Institute of Zoology and Parasitology in Kabul and in an enclosed yard in Kandahar. Hunters living near Girishk said they were usually successful when gazelle hunting. In November our party saw a single male crossing the highway near Kalat-i-Ghilzai.

Mr. Street collected two males (one subadult) and two females (both subadult) on a pebble desert about 30 km. northeast of Girishk. The young females were hornless. The extreme measurements of the skins are: HB, 855-1,008; T, 154-192; HF, 302-337; and E, 141-150.

Immediate measures should be undertaken to restrict the indiscriminate hunting of this species. Ten years ago a trip between Kabul and Herat would have taken about a week, frequently longer. Today, because of a paved road, the same trip can be completed in a day or two. This road traverses some of the best gazelle habitat in

FIG. 44. Estimated limits of current distribution for *Cervus elaphus* (C), *Moschus moschiferus* (M), and *Gazella subgutturosa* (G). Records for *Cervus* are circled; other records are for *Gazella* excepting single locality shown for *Moschus*. Records of *Cervus* marked A are of antlers decorating religious shrines. These antlers were undoubtedly found elsewhere, probably along the Amu Darya.

Afghanistan. Hunting pressure will undoubtedly increase because of this increased accessibility to their native haunts, but perhaps the actual use of vehicles to run them down is of greater import as Lay (1967) remarks: “. . . [In Iran] the great herds of two or three decades ago have been wantonly decimated by jeep hunting. . . .”

Gazella gazella (*vide* classification in Ellerman and Morrison-Scott, 1951, pp. 392–393) has been collected approximately 145 km. west (Lydekker, 1908, p. 499; Qayen [= Kain], Iran), 200 km. south (Blanford, 1876, p. 91; Jalk [= Jalq], Iran) and 40 km. east (Murray, 1887, p. 23; Sagee, Baluchistan) of South Afghanistan. Approximately 80 per cent of the triangle formed by these localities encompasses South Afghanistan. It is assumed that eventually this species will be collected in Afghanistan.

Capra hircus Linnaeus

Persian Wild Goat

Capra hircus Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 68.

Capra hircus aegagrus Erxleben, 1777, Syst. Tegn. Anim., p. 260. Persian wild goat.

Type locality.—SE Russia: Dagestan district of Caucasus.

Distribution.—

GENERAL: After Ellerman and Morrison-Scott (1951, p. 405): “. . . wild forms occur in the Greek Islands, Caucasus, Southern Turkmeniya in Russian Turkestan, Asia Minor, Persia, [Afghanistan], to Baluchistan and Western Sind, India.”

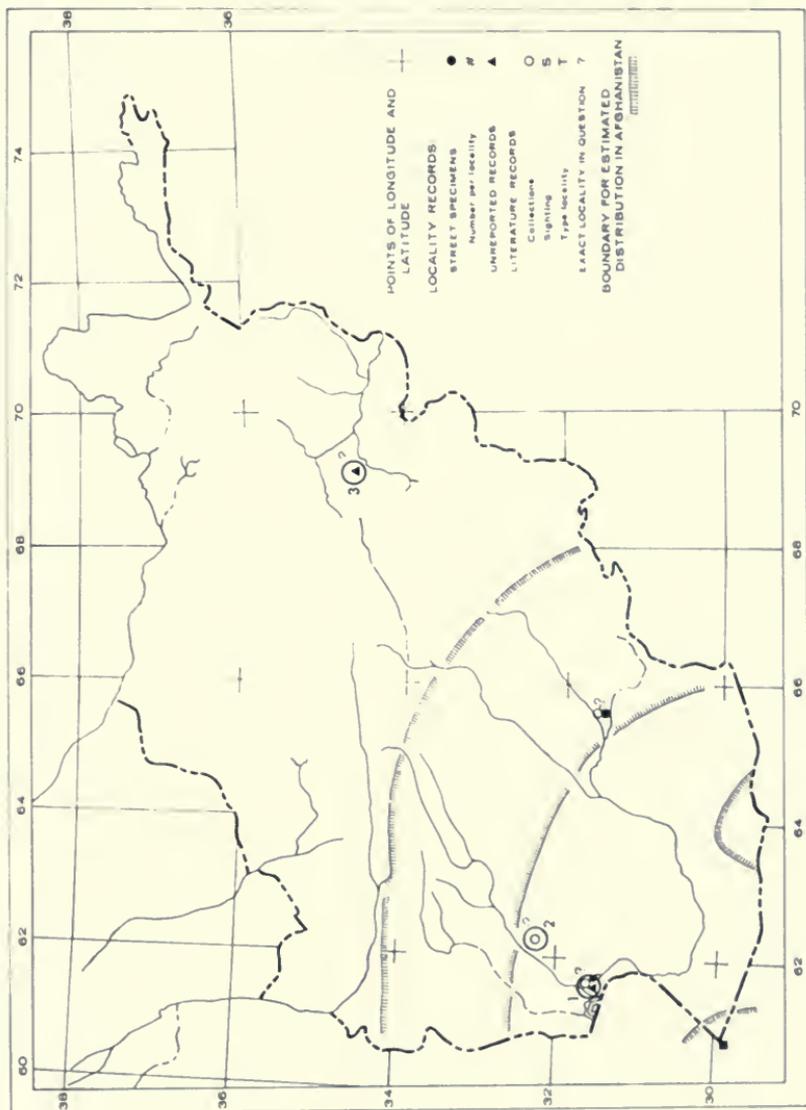
AFGHANISTAN RECORDS: Hutton (1842, pp. 523–535; 1846, p. 161), Selater (1891, p. 143), Kullman (1965, p. 14).

1965 Street Expedition (photo taken in Kandahar).

Third Danish Expedition, 1948–1949 (South of Farah, Kabul).

AFGHANISTAN HABITAT: Barren, rocky hills and mountains, usually above 1,000 m.

FIG. 45. Records and estimated limits of distribution for *Capra hircus*. (Extralimital record *vide* Lay, 1967, p. 227.) Circled records 1, 2, and 3 denote religious shrines where horns of *C. hircus* were found, however *hircus* does not live on plains (sites 1 and 2) and is not known to occur as far NE as Kabul (site 3). Therefore these horns must have been carried to the illustrated sites, perhaps from mountains in South and West Afghanistan or possibly from Iran.



Discussion.—

With the exception of Hutton the above records refer to collections of skulls. Hutton (1842b) gives the dimensions of: “. . . a full grown individual living in my possession at Candahar.” Unfortunately, this specimen (a nine year old male: “. . . judging from the joints of the horns.”) was not preserved. Sclater (1891) lists the skull of a male collected by Sir A. Burns in: “Afghanistan.”

According to Kullman (1965): “. . . the bezoar-goat (*Capra hircus*), had not been recorded from Afghanistan in the past. . . . The first indication of the existence of the bezoar goat was found on tombs in Seistan and near Farah. The head of a freshly killed specimen was later sent to us from Kandahar . . .” Kullman used Ellerman and Morrison-Scott (1951) as his principal reference but it does not cite the specimens reported by Hutton or Sclater.

In Kandahar a hunter gave Mr. Street a photo of the results of a hunting expedition in which the ten carcasses of goats and sheep displayed included three male *Ovis ammon* and three male *Capra hircus*. This photo was ostensibly taken in Kandahar and the locality of the hunt was said to be the mountains near Kandahar.

Blanford (1888–91, p. 503) asserts that *C. hircus aegagrus*: “. . . is found on the barren hills of Baluchistan and Western Sind, but not east or northeast of the Bolan Pass and Quetta, as it is replaced by *C. falconeri*.”

The above records suggest the eastern limits of distribution for this species approximates 68° E longitude.

Capra ibex Linnaeus

Ibex

Capra ibex Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 68.

Type locality.—Switzerland: Valis.

Distribution.—

GENERAL: Alps of Northern Italy, Caucasus, Russian Turkestan, Central Siberia, Mongolia, Sinkiang, Kashmir, Northern Punjab, Afghanistan, Palestine, Arabia, Egypt, the Sudan, and Abyssinia.

AFGHANISTAN RECORDS: Aitchison (1889, p. 64), Kullman (1965, p. 14).

1965 Street Expedition: FMNH 104013–015.

Third Danish Expedition, 1948–1949 (Bamian).

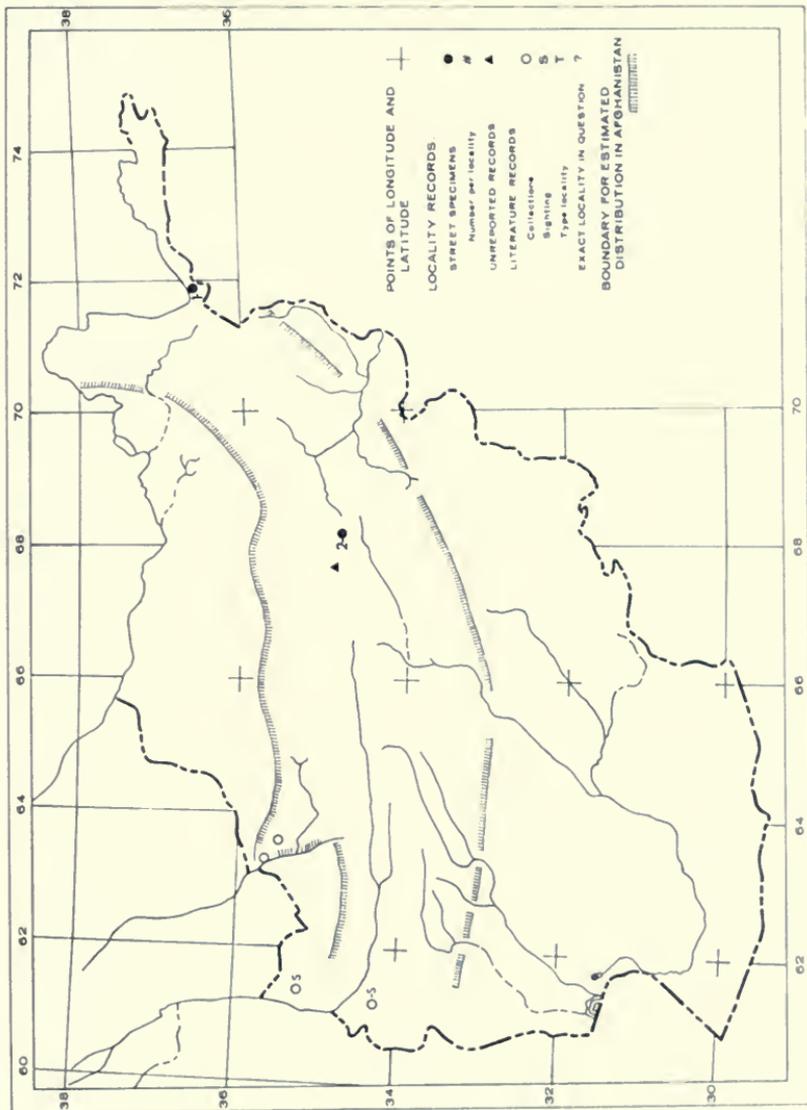


FIG. 46. Records and estimated limits of distribution for *Capra ibex*.

AFGHANISTAN HABITAT: Mountains about 1,500 m. preferring rocky, alpine, and subalpine biotopes.

Discussion.—

The above records are based mainly on skulls. Kullman (1965, p. 14) points out: "It [*C. ibex*] apparently occurs in all highlands of Afghanistan, as in every province the tombs of saints are decorated with its horns."

Aitchison (1889) writes: "The Ibex was very numerous, and frequently seen on the more rocky parts of the Badghis. . . The rocks in localities such as the Sim-koh country and Kambao Pass, suddenly spring out distinct from the rolling plains on all sides to a few hundred feet in height; these sudden perpendicular ridges are the ordinary haunts of the Ibex. . ." Aitchison's records are exceptional as ibex are usually found at higher elevations.

In July we obtained a young male (HB, 691) and a young female (HB, 682) 13 km. south of Shibar Pass at approximately 3,300 m. Neither specimen had horns. We purchased the head of a freshly killed, adult female in the Wakhan. I noted three pairs of male ibex horns in this same locality.

***Capra falconeri* Wagner**

Markhor

Aegoceros (Capra) falconeri Wagner, 1839, Munch. Gelehrt. Anz., 9, p. 430.

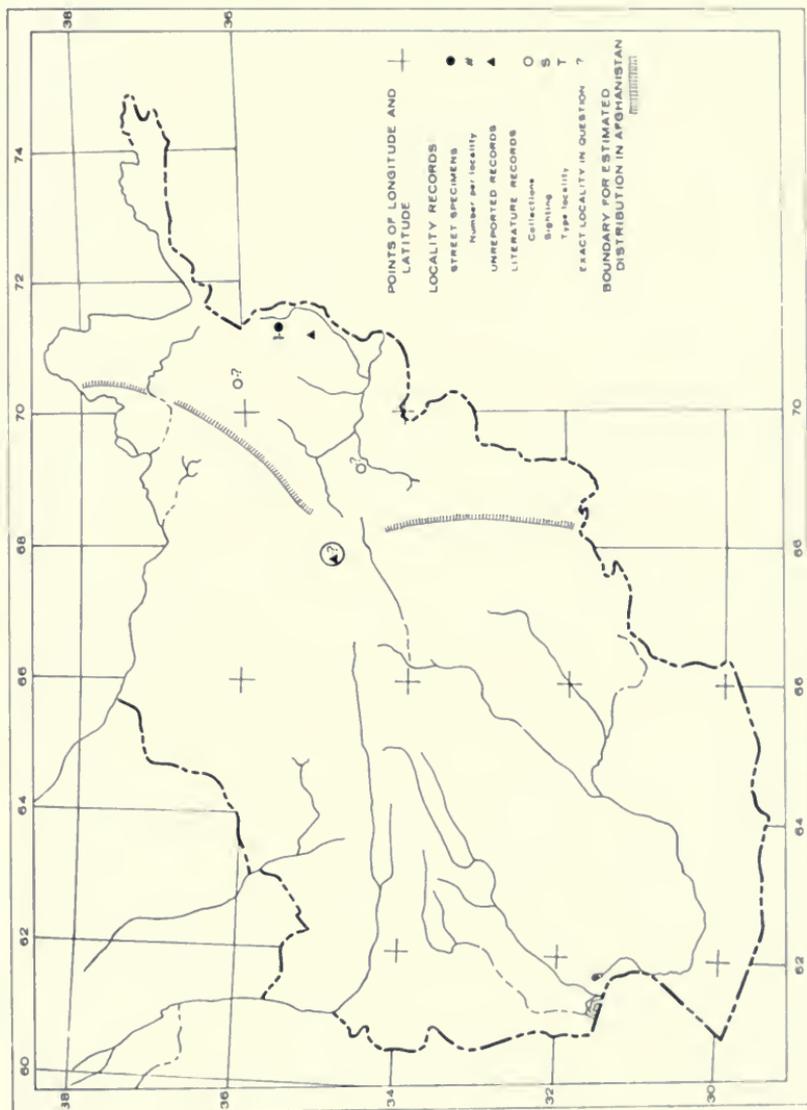
Type locality.—Kashmir.

Distribution.—

GENERAL: Southern Russian Turkestan, Afghanistan, Kashmir, Punjab, Baluchistan.

Adams (1858, p. 528) erroneously lists the distribution of this species as including even Persia and notes a record of a pair of horns from Herat which: ". . . resembled, again, the specimens from Cashmere, only more rounded in their configuration, and had fewer twists." The markhor is not known from Iran or from within 700 km. of Herat (see *Discussion*). There is little doubt that this "extralimital record" of *C. falconeri* is based on a mislabeled pair of horns, or on horns which for some purpose (possibly to adorn a grave) were transported from east of Bamian to Herat.

FIG. 47. Records and estimated limits of distribution for *Capra falconeri*. Circled record is site of holy tomb where a horn of this species was seen.



AFGHANISTAN RECORDS: Hutton (1842, pp. 535-542), Ward (1928, pp. 340-342), Kullman (1965, p. 14).

1965 Street Expedition: FMNH 104012 (skin, skull, and skeleton).

Third Danish Expedition, 1948-1949 (horns and skulls purchased at Wama, Nuristan, and horns seen on a religious shrine near Bamian).

AFGHANISTAN HABITAT: According to Blanford 1888-1891, p. 508): "In Afghanistan, where forest is, as a rule, wanting, the markhor is found in stony ravines and on steep hillsides, and is found in some places at a low elevation." The markhor now evidently inhabits areas above 1,500 m. in alpine and subalpine habitat supporting mesophytic vegetation.

Discussion.—

Hutton (1842c, p. 535) described *Capra megaceros* (= *C. falconeri megaceros*) from Afghanistan. The exact type locality is unknown. According to Hutton (1842c, p. 535); "The Markhore is an inhabitant of the same hills of the foregoing species [*Capra hircus*], but its range appears to be somewhat more limited. Numbers are said to be found in the Soolimaun ranges, and away to the northward of Cabool, Of a female which lived in my possession at Kandahar, the following are the measurements: . . ." These remarks led Lydekker (1913, p. 167) to assign northern Afghanistan as the type locality of this subspecies, while, according to Ellerman and Morrison-Scott (1951, p. 408), Kandahar is the type locality and it ranges to Baluchistan. This latter work is probably wrong because the markhor has not been reported from the mountains west of the main road between Kandahar and Kabul. East of this road in the Sulaiman mountains is the range of *C. falconeri jerdoni*, which, according to Ward (1928, p. 340), is distributed in: ". . . the trans-Indus hill ranges on the frontier of the Punjab, Afghanistan, and Baluchistan, extending . . . to the Quetta district." Further, the type locality of a third subspecies, *Capra falconeri chialtanensis*, is the Chialtan Range, near Quetta, Baluchistan. It seems unlikely that the range of *C. falconeri megaceros* also approaches Quetta, as it must if we concur with Ellerman and Morrison-Scott's suggestion that *C. falconeri megaceros* ranges from Kandahar to Baluchistan. Indeed, a record from near Kandahar (situated below 1,500 m. in dry Afghanistan) would be exceptional, as the range of the markhor from southeast Russian Turkestan to immediately west of Quetta approximates the eastern rim of

the Iranian Plateau, thus, in part, reflecting an association of this species with somewhat mesophytic habitat as contrasted with *C. hircus* and *C. ibex*, both of which may be found in more arid localities. Irrespective of this argument, subsequent records of *megaceros* are from north and east of Kabul, not from Kandahar or Baluchistan.

The extremes of the configurations of the seven pairs of horns (straight-line length ranging from 420 to 850) purchased by Paludan (Third Danish Expedition) at Wama, Nuristan, approximate the shape of the horns of *C. f. megaceros* and *C. f. cashmiriensis* as illustrated by Ward (1928, p. 241).

Near Kamdesh three hired hunters returned with a young male-markhor (on October 16, 1965) within two days of our initial request for sheep and goats. The alleged site of its demise was about 16 km. north of Kamdesh at approximately 2,100 m. This goat measured: HB, 883; T, 145; HF, 330; E, 120; and height at the shoulder 740 mm. The straightline length of its horns taken from the posterior side of the base to the tip is 210 mm.

Ovis ammon Linnaeus

Wild Sheep

Capra ammon Linnaeus, 1758, Syst. Nat., 10th ed., 1, p. 70.

Type locality.—Kazakh SSR.: Semipalatinsk Oblast: near Ust' Kamenogorsk on the Irtish River.

Distribution.—

GENERAL: From Sardinia, Corsica, the Iranian, and Ust-Urt Plateaus eastwards to Mongolia, Tibet, and the Himalayas.

AFGHANISTAN RECORDS: Blyth (1840, p. 62; 1841, pp. 195–197), Hay (1840, pp. 440–443), Hutton (1842a, pp. 514–521; 1846, p. 152), Aitchison (1889, p. 63), Ward (1928, pp. 380, 381), Kullman (1965, p. 14), Povolny (1966, p. 310), McDonald (1968, pp. 10–14).

1965 Street Expedition: FMNH 104016–019, skulls only.

Garber (1963, *in litt.*), Dr. C. Douglas (1965, *in litt.*).

AFGHANISTAN HABITAT: Montane, not commonly found below 1,000 m., may range as high as 5,795 m.

Discussion.—

The classification here followed is that of Tsalkin (1951) who regards the Old World sheep as a single, polymorphic species to which the name *Ovis ammon* Linnaeus, 1758, applies. Thus speci-

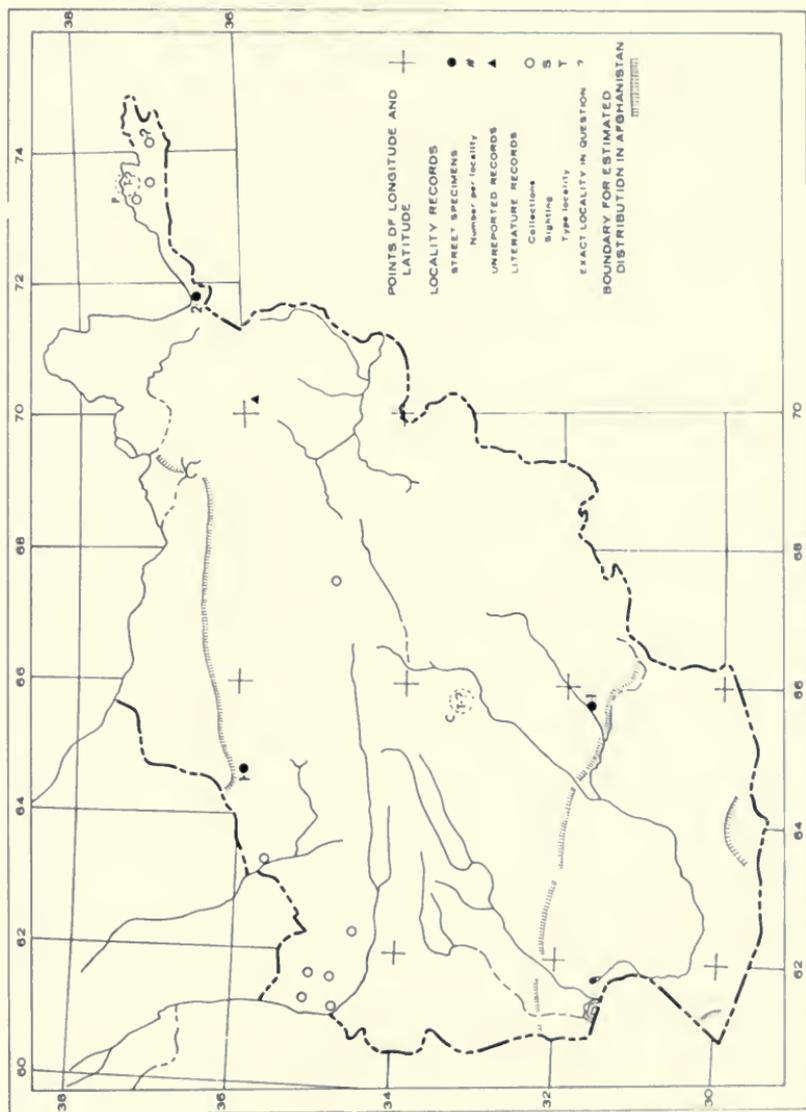
mens from Afghanistan which have been reported as *O. orientalis* or *O. vignei* are herein considered as belonging to the species *Ovis ammon*.

Two subspecies are known from Afghanistan: *Ovis ammon cycloceros* and *O. ammon poli*. *Ovis cycloceros* (= *O. ammon cycloceros*) was described by Hutton in 1842a from a sheep: ". . . brought by a chief from the Huzarreh [Hazara] hills to Candahar, . . ." This subspecies has been found throughout Afghanistan, exclusive of the range of *poli* in the Wakhan. It is abundant in Afghanistan. For example: Dr. C. Douglas (1965, *in litt.*) writes: "We saw herds of up to 200 *Ovis vignei* [= *O. ammon cycloceros*] north of Anjumin Pass." The Street Expedition obtained four skulls of males, the largest having horns measuring 630 mm. in length. Specimens of this subspecies are being maintained in captivity at the Kabul Institute of Zoology and Parasitology.

The Marco Polo sheep (*Ovis ammon poli*), according to Caruthers (1949), ". . . rediscovered by Burnes, in 1834, and the first specimen retrieved by Wood in 1838 enabled Blyth to name it in 1840." Blyth (1840, p. 63) remarks, ". . . an animal called the Rasse was indicated, from report, in Sir Alexander Burnes' 'Travels in Bokhara,' ii. 208, and its horns have since been transmitted to the Royal Asiatic Society by Lieut. Wood, of Sir A. Burnes' party,¹ through the medium of G. T. Vigne, Esq." Wood (1872) in the narrative of his *Journey to the Source of the River Oxus* (= *Amu Darya*), describes the collection of at least one sheep in the valley leading to Lake Siri Kol (= Victoria Lake), noting, "A skeleton of this animal and several complete crania, were deposited, I believe, at Indiana." According to a footnote (*in* Wood, 1872, p. 241), the horns of one specimen forwarded to the Royal Society by Wood measure 4 ft., 8 in. in length, 14 $\frac{1}{4}$ in. around the base, and 3.0 ft. between the tips. The type for *poli* has the same measurements with one exception, namely Blyth (1840, p. 63) describes the tips as pointing, ". . . obliquely backwards, 45 inches [not 36 inches] apart."

¹ Lieutenant Wood was responsible to Sir Alexander Burnes, but he was not accompanied by Burnes during his journey to the source of the Oxus.

FIG. 48. Records and estimated limits of distribution for *Ovis ammon*. Type localities—indicating regions of possible collection—are for subspecies *cycloceros* (C) and *poli* (P). In Afghanistan, *cycloceros* is generally found west of 73° east long., whereas *poli* ranges east of this meridian.



There is no evidence, either in Blyth's (1840) description or in Wood's (1872) narrative to support Ellerman and Morrison-Scott's (unexplained) listing of, "Near the sources of Syr Darya . . ." as the type locality for *poli*; rather the available evidence suggests that the type locality is near the sources of the Oxus (= Amu Darya), or more specifically: along the Afghan-Tadzhikistan border, west of Lake Siri Kol (= Lake Victoria), see Figure 48.

Poncins (1895, pp. 59-60) observes: "They [*O. poli*] are not common in summer all along the Aksu, but the neighboring hills on the northern, eastern, and southern sides of the great Victoria Lake [= Lake Siri Kol], are full of *Ovis*."

Garber (1963, *in litt.*) hunted for Marco Polo sheep in September, 1963. His party followed Wood's route along the headwaters of the Amu Darya toward Lake Siri Kol. Roughly 50 km. west of this Lake, Garber's party turned: ". . . south away from Russia . . . into the valley of the Marco Polo sheep—the private hunting ground of the king of Afghanistan, . . ." A temporary hunting camp was located at approximately 4,600 m. elevation. Garber writes, "We saw more than 100 rams [13 September 1963] head out of the valley for higher ground in the glaciers." He shot two wolves, and his party accounted for three sheep, one of which was collected near 5,500 m., above the permanent snow line.

Garber hunted south of the north fork (= Pamir river) of the Amu Darya, but subsequently at least seven trophy hunters were guided to the Tulobi valley near Sarhad-i-Wakhan (4,070 m.), which is north of the south fork (= Wakhan river). McDonald (1968, p. 10) describes the Tulobi valley, adding, "During eight days hunting I had seen one hundred thirty-three sheep. George Dalziel, who is an experienced sheep guide in Canada, agreed with me that there are between four and five hundred sheep in the King's reserve."

SUMMARY

This survey of mammal species (excluding bats) known from or thought to occur in Afghanistan provides for the first time under one cover a compendious history of contributions, an account for each of 84 species including tabulated measurements of skins and distribution maps, and a gazetteer of localities cited in text. It is based primarily on 1,313 specimens contained in 58 species and distribution data resulting from the 1965 Street Expedition, and on a critical review of publications and other collections.

The following taxonomic contributions beyond those presented by Ellerman and Morrison-Scott (1951), Atallah and Harrison (1968), and Niethammer (1965, 1969) result from this study:

Crocidura zarudnyi zarudnyi Ognev, 1928, is, on the basis of new collections of *zarudnyi*, considered to be a distinct species and not, as postulated by Ellerman and Morrison-Scott (1951), a subspecies of *Crocidura pergrisea* Miller, 1913.

Crocidura zarudnyi streetorum Hassinger, 1970, a new subspecies of shrew, has been described from the mountains of Afghanistan.

Lepus capensis Linnaeus, 1758. Evidence is presented which shows that characters used by Ellerman and Morrison-Scott (1951) and Petter (1961) to separate *capensis* from other species of *Lepus* have subspecific rather than specific significance.

Meriones crassus zarudnyi Heptner, 1937, is, in fact, *Meriones zarudnyi* and not a subspecies of *Meriones crassus* Sundevall, 1842.

Topotypes collected at or near type localities by the 1965 Street Expedition include: five *Hemiechinus auritus megalotus* Blyth, 1845, from Kandahar (1,000 m.); 30 *Ochotona rufescens rufescens* Gray, 1842, from Paghman (2,500–2,600 m.); 27 *Calomyscus bailwardi mustersi* Ellerman, 1948, from Paghman (2,550–2,850 m.); 22 *Meriones crassus swinhoei* Scully, 1881, from between Kandahar and Spin Baldak (1,000–1,100 m.); 15 *Meriones libycus erythrourus* Gray,

1842, near Kandahar and Spin Baldak (1,000–1,100 m.); 11 adult *Mus musculus bactrianus* Blyth, 1846, from Kandahar (about 1,000 m.); eight *Nesokia indica huttoni* Blyth, 1846, and one *Allactaga elater indica* Gray, 1842, from near Kandahar (about 1,000 m.); one sub-adult *Allactaga euphratica caprimulga* Ellerman, 1948, from Shibar Pass (2,623 m.); four *Vulpes vulpes griffithi* Blyth, 1854, from near Kandahar (1,000 m.); and 20 *Herpestes auropunctatus pallipes* Blyth, 1845, from Kandahar (1,000 m.).

As a result of this survey, nine species are reported from Afghanistan for the first time:

<i>Crocidura suaveolens</i>	<i>Jaculus blanfordi</i>
<i>Crocidura zarudnyi</i>	<i>Allactaga hotsoni</i>
<i>Microtus juldashi</i>	<i>Martes flavigula</i>
<i>Gerbillus cheesmani</i>	<i>Moschus moschiferus</i>
<i>Meriones zarudnyi</i>	

Too, new distribution records are illustrated for 60 species and have contributed to *significant* range extensions for four of them: *Crocidura zarudnyi*, *Ochotona macrotis*, *Microtus juldashi*, and *Microtus socialis*.

Insofar as warranted by new evidence, ambiguous or erroneous data published in the literature have been clarified or confuted.

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GAZETTEER

The exact location and spelling of Afghan place names is often difficult because of differing ways of transliterating names from Arabic to English letters, as well as the application (on different maps and in the literature) of various names to one locality or one name to several localities. This real or potential ambiguity is compounded further by the instability of province names and boundaries. Therefore, to make the exact location of distribution records more certain, each locality is designated by a place name and, for finding purposes, map co-ordinates. In addition, place names have been listed with an appropriate natural area (see fig. 49).

This gazetteer is limited to place names that are cited in the text of this paper. When possible, the place names and co-ordinates employed by the *Times Atlas of the World, Mid-Century Edition*, John Bartholomew (1959), are used. Otherwise, reference is made to maps compiled by the Army Map Service and published by the Corps of Engineers, Washington, D. C.: Afghanistan 1301 Series, 1:1,000,000 (1960); and 0511 Series, 1:253, 440 (1941, 1942, and 1948).

The abbreviation *ca.* before co-ordinates indicates that the place name was not found on any of the maps used, but according to information provided in the literature or by the collector (*in litt.*), should lie at or near the point given. Co-ordinates prefixed with an asterisk (*) depict a general region or locality rather than a point.

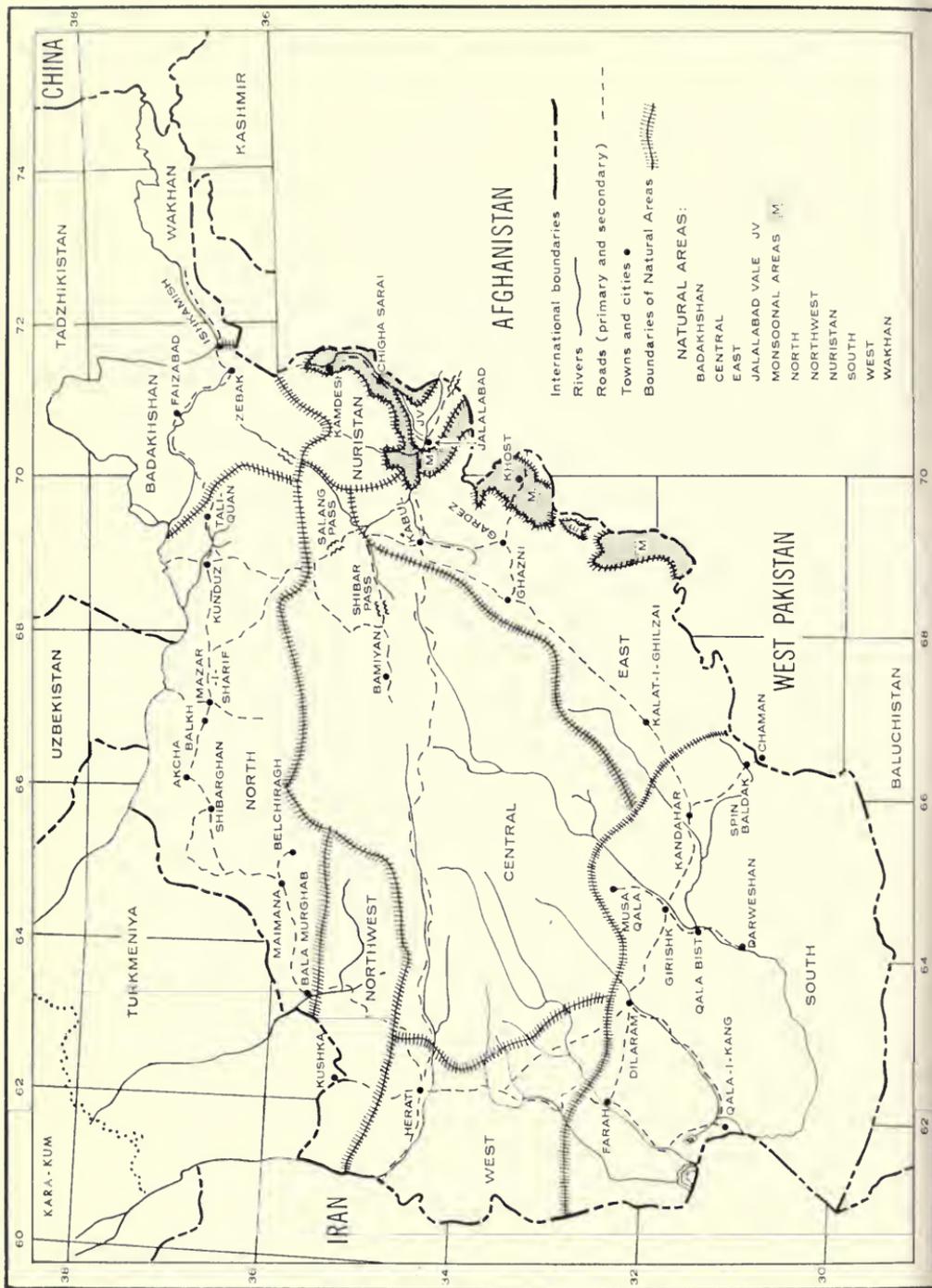
To facilitate the use of this gazetteer, Figures 1 and 2 (from Hassinger, 1968, pp. 14, 16) are here reproduced as Figures 49 and 50.

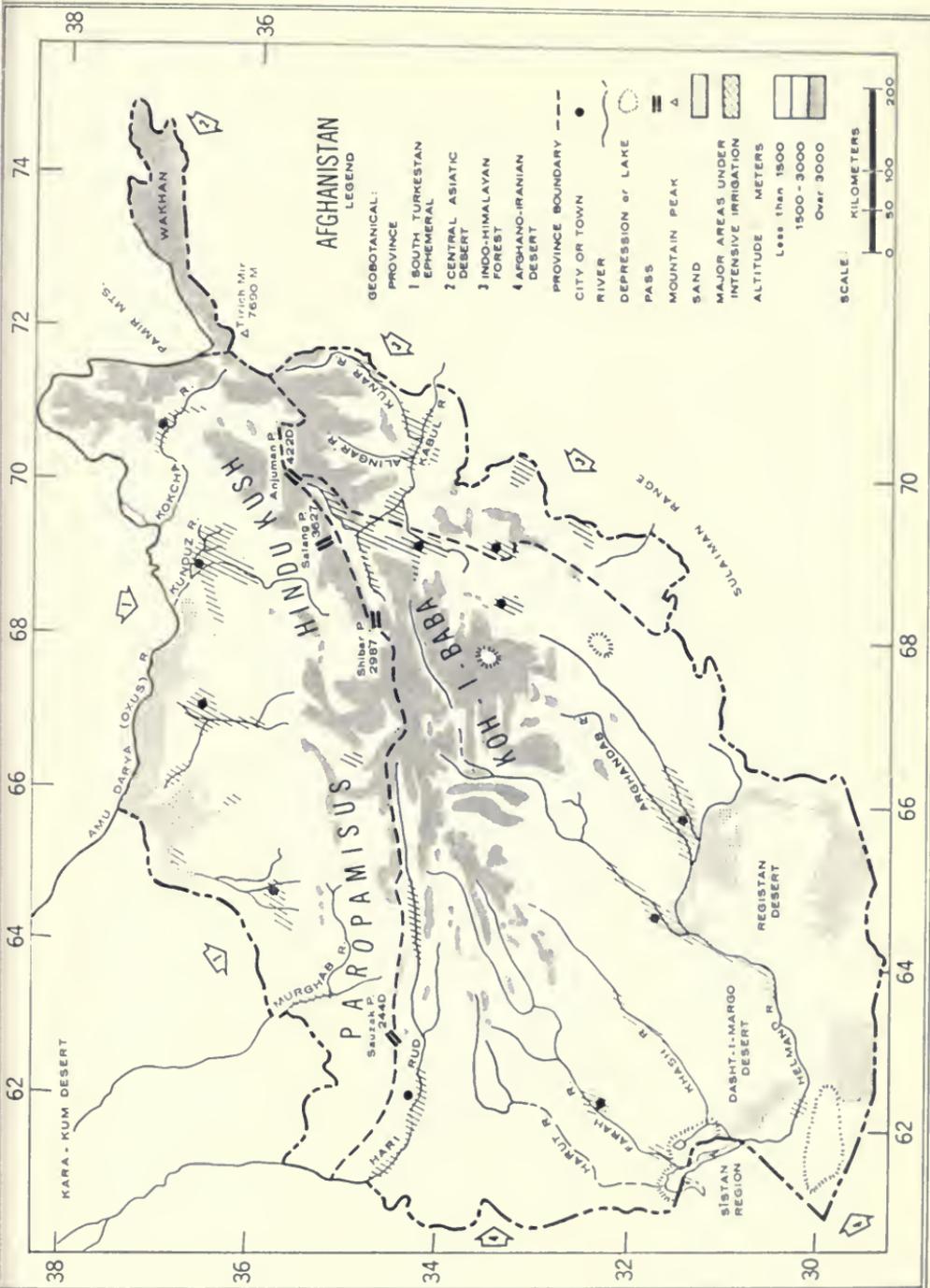
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FIG. 49. The natural areas and geographic relationships of Afghanistan.

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FIG. 50. Major natural features of Afghanistan and the geobotanical provinces of Linchevsky and Prozorovsky (1949).





AFGHANISTAN

LEGEN

GEOBOTANICAL:

- PROVINCE
- 1 SOUTH TURKESTAN EPHEMERAL
- 2 CENTRAL ASIATIC DESERT
- 3 INDO-HIMALAYAN FOREST
- 4 AFGHANO-IRANIAN DESERT

- PROVINCE BOUNDARY - - -
- CITY OR TOWN ●
- RIVER ~~~~~
- DEPRESSION or LAKE ○
- PASS ≡
- MOUNTAIN PEAK ▲
- SAND ▨
- MAJOR AREAS UNDER INTENSIVE IRRIGATION ▩
- ALTITUDE METERS
- Less than 1500
- 1500 - 3000
- Over 3000



PLACE NAME	NATURAL AREA	CO-ORDINATES	
		North Lat.	East Long.
Ab-e-Istada		See Ab-i-Istada	
Ab-i-Istada	East	32.32	67.57
Amu Darya (river)	North Afghan boundary	See fig. 50	
Anjuman Pass	Badakhshan	*35.50	70.07
Arghandab River	East, South	See fig. 50	
Asku	Tadjikistan, S.S.R.		
Badakhshan	A natural area	See fig. 49	
Badghis (region)	Northwest	*35.10	62.00
Badkhyz Reserve	Turkmeniya, S.S.R.	*35.50	61.40
Baqrabad		See Baqrabad	
Bala Murghab	North	35.34	64.35
Balkh	North	36.46	66.50
Balkh River	North		
Baluchistan (province)	W. Pakistan	See fig. 49	
Bamian		See Bamian	
Bamiyan	Central	34.49	67.56
Bandau Hills	Iran	ca. *30.30	61.25
Baqrabad	South	31.30	61.37
Bashgul River	Monsoonal Afgh.	Kunar R. tributary	
Beloochistan		See Baluchistan	
Bisut	Jalalabad Vale	ca. 70.30	34.24
Bokan	North/Northwest ¹	63.32	35.43
Bokun		See Bokan	
Bolan Pass	W. Pakistan	*29.40	67.30
Cabool		See Kabul	
Candahar		See Kandahar	
Central Afgh.	A natural area	See fig. 49	
Chagha Sarai		See Chigha Sarai	
Charikar	East	35.02	69.13
Chashma-Sabz	West	34.50	61.35
Chashma-Sabz Pass	West	*34.53	61.37
Chap Darrah	Wakhan	Not located	
Chialtan Range	W. Pakistan	*35.30	72.00
Chigha Sarai	Monsoonal Afgh.	34.52	71.10
Chitral Valley	W. Pakistan	*35.45	71.50
Dahana	Central/North	35.51	68.30
Danaghori		See Dahana	
Darkat	Badakhshan/North	ca. 69.20	37.10
Dasht-i-Barang	South	32.05	61.35
Dasht-i-Nawar	Central	33.44	67.45
Dasht-i-Nawar		See Dasht-i-Nawar	
Dilaram	South	32.11	63.27
Doab	Central	35.29	68.52
Doshi	Central	35.38	68.43
East Afgh.	A natural area	See fig. 49	
Eshkasham		See Ishkamish	
Faizabad	South	*31.32	61.36
Farah	South	32.23	62.08
Farah Rud (river)	South and Central	See fig. 50	
Gal-i-Cha		See Galichah	

¹ A diagonal (/) indicates that the locality in question more or less straddles the transition zone between two or more natural areas.

PLACE NAME	NATURAL AREA	CO-ORDINATES	
		North Lat.	East Long.
Galichah	West	34.58	61.14
Gardez	East	33.37	69.09
Gatai	South	31.05	66.22
Ghazni	East	33.33	68.28
Gilzai	Central	*34.30	67.35
Girishk	South	31.50	64.35
Golandar	Iran	32.24	59.40
Gulam-i-Maidan	Northwest West	*35.00	61.15
Gulbahar	Central	35.09	69.17
Gulistan	W. Pakistan	30.37	66.35
Guljander		See Golandar	
Gulran	Northwest/West	35.06	61.41
Gursalak	Monsoonal Afgh. Nuristan	35.01	70.51
Gusalak		See Gursalak	
Hari Rud (river)	Central, West	See fig. 50	
Hazara (village)	Central	32.48	65.54
Hazara Hills, not located	but presumably near the village of Hazara.		
Hazarajat (region)	Central	*33.45	66.00
Helmand River	Central, South	See fig. 50	
Herat	West	32.20	62.10
Hindu Kush Mtns.	Western extension of the Himalayas in Afghanistan.		
Huzzarrah Hills		See Hazara hills	
Iranian Plateau—A large plateau encompassing parts of: Iran, Baluchistan, and Afghanistan.			
Ishkamish	Badakhshan	36.43	71.34
Ishmurkh Darrah	Wakhan	Not located	
Islam Qala	West	34.39	61.03
Jalalabad	Jalalabad Vale	34.26	70.25
Jalalabad Vale	A natural area	See fig. 49	
Jalk	Iran	27.36	62.41
Jalq		See Jalk	
Jurm	Badakhshan	36.50	70.52
Juwain	South	31.42	61.40
Kabul	East	34.30	69.10
Kafiristan		See Nuristan	
Kain		See Qayen	
Kala-i-Khumba	Tadzhikistan, S.S.R.	38.30	70.45
Kalat-i-Ghilzai	East	32.05	66.53
Kalat-us-Siraj		See Laghman	
Kambao Pass	West/Northwest	*35.05	61.26
Kamdesb	Monsoonal Afgh.	35.25	71.26
Kamiab		See Kham-i-Ab	
Kandahar	South	31.36	65.47
Kang		See Qala-i-Kang	
Karaol-Khana		See Karawal-Khana	
Karawal-Khana	North/Northwest	35.43	63.14
Kataghan	A province	37.00	69.00
Kham-i-Ab	North	37.32	65.42
Khanabad	North	36.42	69.05
Khelat-i-Ghilzai		See Kalat-i-Ghilzai	
Khyber Pass	Jalalabad Vale	*34.06	71.55
Kila Wali		See Qala Wali	
Kin	South	32.15	61.35
Kizil Islam Qal'eh		See Islam Qala	
Kohat	W. Pakistan	33.32	71.30
Koh-i-Baba Mtns.	Central	See fig. 50	

PLACE NAME	NATURAL AREA	CO-ORDINATES	
		North Lat.	East Long.
Kohsan	West	34.38	61.10
Kojak Pass	W. Pakistan	*30.54	66.28
Kokcha River	Badakhshan	See fig. 50	
Kootai	W. Pakistan	35.20	71.34
Kukche River		See Kokcha River	
Kunduz	North	36.47	68.51
Kushk	Northwest/West	34.53	62.30
Kushka	Turkmeniya, S.S.R.	35.14	62.15
Kushk-Rud	Northwest/West	34.22	62.05
Kustaki	Monsoonal Afgh./Nuristan	35.29	70.56
Laghman	Jalalabad Vale/Monsoonal Afgh.	34.40	70.18
Lataband Pass	East/Central	*34.30	69.34
Maiden-Tal Valley	Central	*34.27	68.50
Maimana	North	35.54	64.43
Mangalpur	Monsoonal Afgh.	34.06	69.51
Mangall		See Mangalpur	
Mara-Chak		See Maruchak	
Maruchak	North	35.50	63.08
Mashhad	Iran	36.18	59.36
Mazar-i-Sharif	North	36.43	67.05
Miana Bam	Northwest	35.10	63.33
Monsoonal Afgh.	A natural area	See fig. 49	
Murghab River	Northwest, North	See fig. 50	
Musa Qala	South	32.23	69.49
Nao	Badakhshan	35.54	70.44
Nau		See Nao	
Nijrao	East	ca. 34.40	69.45
Nijrow		See Nijrao	
North Afgh.	A natural area	See fig. 49	
Northwest Afgh.	A natural area	See fig. 49	
Nushki	W. Pakistan	29.33	66.01
Nushki Plateau	W. Pakistan		
Nuristan	A natural area	See fig. 49	
Obeh	Central	34.22	63.10
Oxus River		See Amu Darya	
Paghman	East	34.56	58.56
Paktia	A province	*33.30	70.00
Pamir Mtns.	Tadzhikistan, S.S.R.	See fig. 50	
Panjao	Central	34.21	67.00
Panjir Valley		See Panjshir Valley	
Panjshir Valley	Central, East, Nuristan	*35.20	69.40
Parachinar	W. Pakistan	33.54	70.07
Paropamisus Mtns.	Northwest, Central, West	See fig. 50	
Parun Valley	Monsoonal Afgh./Nuristan	*35.25	70.55
Pashki	Monsoonal Afgh./Nuristan	35.25	70.56
Pech Valley	Monsoonal Afgh./Nuristan	*35.00	70.50
Peiwar Kotal (pass)	East	*33.58	69.51
Pesch Valley		See Pech Valley	
Puistagoli	Monsoonal Afgh./Nuristan	35.25	70.55
Pul-i-Khumri	North	35.55	68.45
Pyrandzh River	Tadzhikistan, S.S.R.	*37.06	68.20
Qala-i-Kang	South	31.05	61.52
Qala Nau	Northwest	34.58	63.04

PLACE NAME	NATURAL AREA	CO-ORDINATES	
		North Lat.	East Long.
Qala Vali	North	35.47	63.44
Qayan	Iran	34.44	59.11
Quetta	W. Pakistan	30.13	67.01
Safed Koh (mtn.)	East, Monsoonal Afgh.	*34.15	70.00
Sagee	W. Pakistan	30.28	66.28
Sahlabad	South	31.27	65.28
Salang Pass	Central	*35.24	69.08
Sanglich	Badakhshan	36.17	71.09
Sarhad-i-Wakhan	Wakhan	36.59	73.26
Sar-i-Kol (lake)	Wakhan	*37.25	73.42
Safid Koh		See Safed Koh	
Seistan	South	*31.00	62.00
Sensa	Monsoonal Afgh./Nuristan	35.10	71.10
Shamshir Ghar (cave)	South	31.33	65.28
Shibargan		See Shibarghan	
Shibarghan	North	36.40	65.42
Shibar Pass	Central	*34.55	68.18
Sim Koh (mtn.)	Northwest	*35.13	61.24
Simkoh Hills		See Sim Koh	
Simkoh Hills	(Type locality of <i>Allactaga elater indica</i>)	Not located	
Siri Kol		See Sar-i-Kol	
Sistan		See Seistan	
Soolimaun Mtns.		See Sulaiman Mtns.	
South Afgh.	A natural area	See fig. 49	
Spin Baldak	South	31.00	66.23
Stiewe	Monsoonal Afgh. Nuristan	35.30	70.56
Sufyd Koh		See Safed Koh	
Sulaiman Mtns.	W. Pakistan	*30.00	69.30
Surkhab River	Tributary of Kabul River	*34.21	70.00
Taliq-an	North	36.46	69.29
Tilli	Badakhshan	35.50	70.38
Tirpul	West	34.36	61.16
Toba Plateau	W. Pakistan	*31.00	67.00
Tulobi Valley	Wakhan	*37.07	73.27
Turbat-shaikh-jami River	Iran	*35.15	60.35
Turkmen		See Turkmeniya	
Turkmeniya (province)	U.S.S.R.	See fig. 49	
Victoria Lake		See Sar-i-Kol	
Wakhan	A natural area	See fig. 49	
Wama	Monsoonal Afgh./Nuristan	35.07	70.45
Wazirabad		See Balkh	
Weran Pass	Nuristan/Badakhshan	*35.34	70.52
Weran Valley	Nuristan/Badakhshan	*35.35	70.52
West Afgh.	A natural area	See fig. 49	
Zabol	Iran	31.02	61.30
Zandra	in Zhob Valley, W. Pakistan	Not located	
Zebak	Badakhshan	36.32	71.21
Zhob Valley	W. Pakistan	*31.00	69.20
Zroabad River	Iran	*35.38	61.00



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