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CARNIVORA FROM THE ASIATIC EXPEDITIONS

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In previous papers, brief reports have been made on the Mustelidæ and Viverridæ secured by the Asiatic Expeditions under the leadership of Dr. Roy Chapman Andrews for The American Museum of Natural History. The remaining groups of Carnivora are here dealt with, including the bears, wolves, foxes, and cats (families Ursidæ, Canidæ, Felidæ) of which a magnificent series of skins and skulls was brought back, adequate in some cases for a tentative revision of the many names applied to certain eastern species. The discrimination of geographic races among the larger predaceous mammals is often difficult. Sufficient series from a single region are seldom available for the determination of normal individual variation in color, pattern, or proportions, which has resulted in the frequent bestowal of new names on a quite inadequate basis. Moreover, large carnivorous mammals may often have a wide individual range, so that local varieties are not so easily established as in the case of smaller and more sedentary species. So far as possible, therefore, I have attempted to review critically the various names and descriptions involved for the region covered.

Ursidæ

Selenarctos thibetanus (Cuvier)

Ursus thibetanus F. CUVIER, 1824, 'Hist. Nat. des Mamm.,' Pl. CCXIII and text.

The Asiatic black bear is given generic rank as distinct from the typical genus *Ursus* on account of its color (black with a white crescent on the chest), and the formation of the plantar pads, which in the fore paws have an enormous carpal pad continuous with the palmar pad, while of the digital pads the first and fifth only are continuous with the latter. The species is forest-living and occurs from India to Manchuria and South China. A number of local races have been named, but it must be admitted that the discrimination of most of these rests upon

[1]Publications of the Asiatic Expeditions of The American Museum of Natural History. Contribution No. 91.

a very slender basis, since nearly all are described from single skulls, often of unknown age or sex and without adequate comparison with the typical form. In these large species not only is the individual and sexual variation in skulls so great as to be readily apparent, but the changes coincident with age are also striking. Moreover, these are wide-ranging animals, and a single one may travel over more territory in a day than a mouse or shrew would cover in its entire lifetime, a factor tending to prevent the ready development of local forms. Increasing age is accompanied by a great increase of zygomatic width, accentuation of the lambdoid and sagittal crests, and by the enlargement and deepening of the glenoid cavity of the jaw, so that the cranium of an old bear when placed on a flat surface rests upon the glenoid portion of the skull or the paroccipital processes, instead of upon the condyles as it does in immature animals. Age is also accompanied by a fusion of the cranial bones, so that in adults the outlines of the frontal, parietal, and finally the nasal bones become quite obliterated.

The Asiatic Expeditions secured four skins and skulls of black bears from the forests near Eastern Tombs, Chihli Province, which are thus topotypes of *S. t. wulsini* Howell. Unfortunately, the sex of none of these is known. Two are immature while the two others are adult, the larger perhaps a male. An adult female was also secured at the base of Tai Pei Shan, Shensi, and there are further, available for comparison, four adult skulls from northwestern Corea, Hupeh Province, and "India" respectively, the last representing typical *thibetanus*. A careful comparison of all these, and of the descriptions of *macneilli*, *mupinensis*, and *wulsini* reveals no single character whereby any local form of northern China may be distinguished. Sowerby (1920, Journ. Mamm., I, p. 213) has reviewed the bears of eastern Asia, particularly with a view to identifying those described by Heude, practically all of which he regards as valid species without recharacterizing them. He admits that *S. ussuricus* is much like *S. thibetanus* except that it "seems to have longer hair on the sides of the head and neck." The chief difference is believed to lie in the large size of the last upper molar, which in Manchurian specimens was 27 mm. long in a female, 31 mm. in a male, against 24 mm. in a female of *thibetanus* from the Himalayas and 28 mm. in a specimen representing *mupinensis*. However, in two skulls (unsexed) from India in the Museum of Comparative Zoölogy, representing *thibetanus*, the length of this tooth is 27 and 33 mm. respectively. In the Chihli series it varies from 28 to 32 mm. Evidently there is nothing diagnostic in the size of this tooth as a racial character. Lydekker's *macneilli*, from "some distance"

west of Ta-chienlu, Szechwan, was supposd to differ in its smaller cheek teeth, last molar 25 by 15 mm., but in a skull from Hupeh (M. C. Z. No. 11770) this tooth is 30 mm. long. In *S. t. wulsini* the smaller size of the white chin-spot as compared to *ussuricus* was believed by its describer to be diagnostic, but the series of topotypes secured by the Asiatic Expeditions shows that this, like most white markings in mammals, is very variable and may be large or small (varying in four skins from 45 to 130 mm. in length). In *mupinensis* it is also said to be very small. It is evident from a study of the available material and descriptions that individual variation will acount for most of the supposed racial characters in the subspecies described, and that no truly geographic differences have yet been pointed out that will separate the Himalayan black bears from those of North China.

Selenarctos thibetanus melli Matschie

Selenarctos melli MATSCHIE, 1922, Arch. f. Naturgesch., A, LXXXVIII, pt. 10, p. 34.

Matschie, in 1922, gave the name *melli* to a black bear from Kwangtung Province, near Canton, in South China. The type was captured as a cub, and kept for some three years in captivity, hence may be presumed to show the usual abnormalities of captive animals. Its chief character is said to lie in its small size, for it shows the usual color pattern of *S. thibetanus*. A fine skin and skull from Chunganhsien in Fukien Province was secured by Mr. Clifford H. Pope of the Third Asiatic Expedition and may be regarded as of the same race. It is an adult male with the teeth much worn and all the cranial sutures quite obliterated. In size the skull about equals that of an adult female from Shensi, and since adult females are smaller than males, this may indicate that *melli* is really a smaller subspecies of South China. The single specimen from Fukien is obviously of much less size than the large skulls of *S. thibetanus* assumed to be those of males. The skin, taken in April, is in excellent condition and much shorter-haired than the winter skins from Chihli. If this specimen adequately represents the South China black bear, it seems to indicate a valid race, characterized by its smaller size and shorter coat. Mr. Pope also secured a very young black-bear cub from the island of Hainan that doubtless represents the same animal. Although long ago recorded from this island by Swinhoe, no adult specimens of the black bear seem to have reached museums from Hainan.

Canidæ

Canis lupus laniger (Hodgson)

Lupus laniger Hodgson, 1847, Calcutta Journ. Nat. Hist., VII, p. 474.

The wolf of Mongolia and northern China does not seem to be very different from the typical European race. Three skulls, one of a male, measure about the same as European skulls though none equals in size the large Swedish skull, the dimensions of which are published by Miller (1912, 'Mamm. Western Europe'). In color, the seven skins secured by the Asiatic Expeditions vary considerably according to season and condition of wear, but the best one, killed near Urga, is decidedly pale, the muzzle pale ochraceous-buff grizzled with whitish, forehead slightly darker, backs of ears and an area about their bases contrastingly orange-rufous, fore legs pale buff without trace of the dark stripe on forearm; neck, body, and tail with the usual ochraceous element reduced to buff, the white rings of the guard hairs prominent. Other Mongolian skins are considerably darker: buffy grizzled with black and the forearm stripe may be well developed. The underfur is thick and woolly, in the winter coat especially. In view of the variation in color among wolves of the same region, from pale grayish animals to buff-colored specimens with greater amounts of black in the pelage, it is evidently unwise to recognize several species among them as Matschie has done, unless more essential differences can be established than those shown in the native skins without definite locality which were made by this author the basis of his *Lupus filchneri* and *L. karanorensis*. He also names a third species, *Lupus tschiliensis*, on the basis of a skull, sex unknown, from Chihli, but the measurements are identical with those of Mongolian skulls and the slight differences in cranial proportions upon which he relies are best regarded as purely individual variations. Probably Hodgson's name *laniger*, based on the wolf of Tibet, is applicable to the wolf of Mongolia and North China, an animal very little paler and smaller than that of western Europe.

Cuon rutilans (S. Müller)

Canis rutilans S. Müller, 1839, 'Verhand. Zool. Zoogd.,' pp. 27, 51.

Size of a small wolf; color bright rusty rufous, the tail blacker with a black tip; belly, throat, and edge of upper lip usually white.

Two skins from Yenping, Fukien Province, taken by Rev. H. R. Caldwell, seem to be the first definite records for the province. They are not certainly distinguishable in color from two other skins from western Yunnan (Namting River and Shafun). One of each pair has the belly suffused with the reddish tint of the back.

The type locality of this animal is Bengal, but probably it is not very different from the earlier described *Cuon javanicus* (Desmarest) of Java, of which it may eventually prove to be the mainland subspecies.

Nyctereutes procyonoides (Gray)

Canis procyonoides GRAY, 1834, 'Illustr. Indian Zoöl.,' II, Pl. 1.

Small, fox-like, with short bushy tail; color a mixture of buff, gray, and black, the black-tipped hairs predominating over the back and in a narrow dorsal line from the crown to the tip of the tail; a conspicuous blackish-brown patch on each side of the face from just in front of and below the eye to a point midway to the ear and continued as a narrower line behind the ear. The flanks, sides of neck, and the tail are chiefly a warm buff; feet blackish brown.

Gray's original specimen was sent by Reeves from China, hence no doubt from near Canton. The large series of some twenty specimens, collected mainly by the Asiatic Expeditions, includes ten from Fukien Province which may be taken to represent true *procyonoides*. Three others from eastern Szechwan (Wanhsien) are quite the same, as are also those from Kiangsu, Chekiang, and Hunan Provinces. There is a wide variation in color among skins from the same locality, some having the black-tipped hairs of the back so numerous as to darken the whole upper side while in others they are chiefly confined to the median dorsal line. The entire pelage is more or less suffused with pale ochraceous which is in some skins intensified to a bright rusty. Winter skins in good condition are longer-furred than those of summer. A Fukien specimen taken in December shows the extreme of the intensification, in being almost fox-red all over except for the usual blackish areas and the black-tipped hairs of the dorsal line.

Matschie, in 1908, gave the name *stegmanni* to the racoon-dog of the Yangtze basin, type locality Chunkiang, at the same time stating that the *N. sinensis* of Brass, also from the Yangtze Valley was a synonym of *procyonoides*. The characters he gives (based on a single skull) are, however, unreliable and do not hold good in the present series, so that both these names are undoubtedly synonyms of *procyonoides*. No specimens are at hand from North China, so that it is uncertain if the species varies geographically in that part of its range. Matschie gives names, however, to the slightly larger Ussuri animal as well as to that from Amur Land.

Nyctereutes procyonoides orestes Thomas

Nyctereutes procyonoides orestes THOMAS, 1923, Ann. Mag. Nat. Hist., (9) XI, p. 657.

A slightly paler race. The type was an adult female from the northwestern flank of the Likiang Range of Yunnan and constituted the first record of the genus in western China. Four additional skins (two with skulls) were secured from the same range by the Asiatic Expeditions, and show that the Yunnan animal is after all very similar to that of southeastern China, differing chiefly in the gray instead of buff tone to the paler portions of the longer hairs, though there may be a very slight suffusion of buffy. The throat and feet are black in the type but brownish in the four other skins, while the nearly parallel condition of the zygomatic arches, which formed the chief basis of separation, is evidently an individual aberration since the two other skulls show nothing to distinguish them from those of the typical race. Thomas mentions the abnormal presence of an upper third molar on the right side in his specimen, a peculiarity found on the left side in a specimen collected by the Asiatic Expeditions in eastern Szechwan.

Vulpes vulpes hoole Swinhoe

Vulpes hoole SWINHOE, 1870, Proc. Zoöl. Soc. London, p. 631.

Similar to the red fox of Europe but the sides and especially the thighs more mixed with gray, the fore feet usually with less black, and the red tones less fulvous but more chestnut. The tail has the chestnut confined more to the upper surface; the lower surface is buffy white, its longer hairs black-tipped. Below, white to gray or even pinkish.

A series of seventeen skins, mostly with skulls, from Fukien Province is instructive as showing the range of individual variation in a restricted locality. Although the average skin is more chestnut above with grayer thighs and has a tail that is paler below, clouded with slaty, as compared with European red foxes (Scotland and Germany), nevertheless, there are occasional individuals that differ very little indeed from these latter. In general, the clear chestnut area is confined to a rather narrow median stripe with ill-defined boundaries, becoming more rufous on the tail. The flanks are bright ochraceous frosted with gray-tipped hairs which especially predominate on the sides of the haunches. The blackish area on the sides of the muzzle may be well developed or very indistinct or wanting altogether. The black stripe on the front of the fore leg is usually narrow, bordered by rufous, but may be broad enough to cover the entire front of the leg and extend up on the shoulders. In dark specimens

the throat and belly are suffused with slaty where the dark bases of the hairs show through, and in one skin the wearing away of the white tips of the hairs forms an indistinct black collar. Usually a narrow line of clear bright ochraceous runs along the sides bordering the belly. The last is usually white with grayish underfur, but occasionally the whole under side of the body is deep pinkish buff. In the entire series no skin shows the blackish belly so often seen in Egyptian or European red foxes. Swinhoe, however, found this variation in Fukien and believing it to represent an upland race, named it *lineiventer*. But there can be but little doubt that all the foxes of South China are really referable to a single subspecies to which Swinhoe's first name is applicable, for specimens secured by the Asiatic Expeditions from Chekiang, Hunan, and Maitai Chao, Shansi, do not show any essential differences. Matschie, in 1908, gave several names to foxes from eastern Asia, based on skins purchased in fur markets, but probably most of these are synonyms of *V. v. hoole* or of forms already described from eastern Tibet. His *Vulpes aurantioluteus*, presumed to have come from the mountains of the upper Yangtze, is doubtless the same as *V. v. hoole*, with which it exactly corresponds in its description.

The average condylobasal length of four adult males from Fuching, Fukien, is 135.1 mm., of four females 127.8 mm.

A beautiful skin from Lichiang, Yunnan, is unusually deep in color, the fore and hind feet black, the entire back more fulvous than usual, and the tail much darkened with black. In its general appearance, however, it corresponds with *V. v. hoole*.

Vulpes vulpes tschiliensis Matschie

Vulpes tschiliensis MATSCHIE, 1908, 'Wiss. Ergebn. Exped. Filchner, X,' pt. 1, p. 169.

A larger northern race of similar coloration to the last.

In describing this fox, Matschie supposed that its chief distinguishing feature lay in having the backs of the ears brown instead of black. The type is a mounted specimen from Peking in the Berlin Museum, and may have been somewhat faded, for another skin from the same locality, he says, has the ears blacker.

A single skin secured by the Asiatic Expeditions from Eastern Tombs, in the same province, can be closely matched by one of the less grizzled, fulvous specimens from Fukien. It has, however, a minimum of black on the feet, and lacks any dark mark on muzzle and chin. But its skull is so much larger than in any of the Mongolian or South China foxes, and in

this respect seems to agree so well with the cranial measurements given by Matschie, that it may perhaps represent a distinct northeastern race and I am therefore retaining Matschie's name for it. The condylobasal length is 157 mm., which is 22 mm. greater than the average of four male skulls from Fukien. Skulls from Shensi and Shansi are of intermediate size to 148 mm. for condylobasal length.

This skull is but little inferior in size to one recorded by Ognev from southern Ussuri, eastern Siberia, under the new name *dolichocrania*, the greatest length of which is given as 167.1 mm., while the same dimension (occiput to front of incisors) in the Eastern Tombs skull (A. M. N. H. No. 57070) is 165 mm. It may, therefore, prove that *tschiliensis* ranges to the Ussuri region and that Ognev's *dolichocrania* is a synonym of it.

Vulpes vulpes ?karagan (Erxleben)

Canis karagan Erxleben, 1777, 'Syst. Règne Anim.,' p. 566.

A pallid form, straw-yellow, with rusty on back, neck and shoulders; the paws straw-yellow, with or without black marking.

The collection contains an adult male skin and skull from Tsagan Nor, a skull from Loh, and two young from Tze Tzen Wang, Mongolia, as well as a skin from the Tianshan Range, but all these skins are in such poor condition of pelage through wear and moult, that their true coloration is undeterminable. The feet and noses of the adults, however, appear to be much paler in color than in the more southern foxes of China, so that the specimens doubtless represent a more pallid race, probably close to *V. v. karagan* of the Kirghiz Steppe. In his recent review of the foxes of Russia, Ognev mentions a skin collected by Koslov near Kiakhta and another from the steppes of southern Transbaikalia that seem practically indistinguishable from this race, but it is not clear that the additional forms he names as *V. v. ochroxantha* (Tian-Shan) and *V. v. jakutensis* (south of Yakutsk) are really very different. I am therefore provisionally regarding the Mongolian red fox as *V. v. karagan*.

Felidæ

Felis bengalensis bengalensis Kerr

Felis bengalensis Kerr, 1792, 'Animal Kingdom,' p. 151.

A dozen skins from Lichiang and Wei-shi, Yunnan, are referred to the typical race of the small spotted tiger-cat which, according to Wroughton, is found in India from southern Beluchistan to Upper Burma and Tenasserim. Although about the size of a house cat, it may at once be distinguished by the pale mark on the middle third of the back

of the ear and by the absence of a dark tip to the tail. Its essential pattern consists of stripes and spots on an ochraceous ground, as follows: two narrow black stripes, one from the posterior corner of the eye, the other from just below the eye, pass back along the side of the jaw enclosing a white area between them; the lower stripe is more or less continuous across the upper throat with the corresponding one of the opposite side and there are three or four other imperfect blackish-brown collar-marks on the lower throat; a short white stripe borders the inner and upper edge of the eye; four narrow black stripes run from the upper corner of the eyes to the shoulders, with sometimes a narrow median one on the forehead and crown; the two outer of these become broader posteriorly breaking up into large lengthwise blotches over the shoulders; the inner pair likewise becomes interrupted at the shoulders, but from there is traceable as a nearly continuous pair of stripes to the root of the tail; the sides of the body are marked by about five longitudinal rows of elongate spots which may be all black, or more or less surrounded by ferruginous, or the anterior part of the spot may be of the latter color, the posterior part black. These markings are larger in the males than in females. The belly has a number of blackish-brown spots on a white ground. The tail is buffy with ten or more broken rings of blackish.

In the Yunnan series, the ground color is bright buff or yellowish, sharply marked off from the belly which is white. There is a good deal of ferruginous on the shoulder region, not only tinging the ground color but broadly edging the spots and markings. In extreme specimens the body spots may be chiefly bright rusty slightly and incompletely bordered with black, while at the opposite extreme are skins in which the ferruginous is nearly suppressed, so that the markings are nearly all black on an ochraceous-buff ground. To this latter type belongs the skin described as *Felis anastasiæ* by Satunin, as Lönnberg has recently intimated.

Felis bengalensis chinensis Gray

Felis chinensis Gray, 1837, Mag. Nat. Hist., I, p. 577.

Similar to the typical race in all respects but the back is less clear ochraceous, with a decided gray tinge, and the flanks are grayish.

The collections include a large series of some thirty skins and nearly as many skulls from eastern Szechwan (Wanhsien), Hunan (Yochow), Fukien (Futsing and Yenping), Hainan (Nodoa), and a few other places. They all agree in the somewhat grayish tint to back and sides instead of the clear warm buff to ochraceous of the typical animal. There is much

variation in the pattern and size of the markings. Males are larger, with larger markings than females, and in old age the skulls have a low sagittal crest formed by the union of the temporal ridges, whereas in none of the females seen does this ridge form. Peculiarities of the teeth are the frequent loss of the first upper premolars and in the upper carnassial (p^4) the antero-internal lobe is often much reduced in size or it may even (as in a case noted by Lönnberg) be practically suppressed. In old animals the orbit may be closed by the fusion of the postorbital process with the ascending process of the jugal.

Milne-Edwards's *Felis scripta* is either based on this subspecies whose variation in markings is so deceptive, or it may possibly represent a slightly darker race. Probably also that author's *F. microtis* from near Peking is only a small female of the same, for the supposed reduction of the ears is said by Elliot, who examined the type (and spelled the name *macrotis*), to be fallacious, for they are really of normal size. A large skin, perhaps of a male somewhat stretched, but probably representing the same animal, became the basis of Milne-Edwards's *F. decolorata*, also from near Peking. It may later prove that the tiger-cat of North China is a distinct race, in which case the name *microtis* will be available for it, provided this in turn is not identical with Radde's *F. undata* of Amur Land, which is at most a geographical race of *bengalensis*. In the lack of comparable material from North China, however, this point cannot be settled now.

Felis temmincki dominicanorum P. L. Sclater

Felis dominicanorum P. L. Sclater, 1898, Proc. Zoöl. Soc. London, p. 2, Pl. 1.

About twice the size of a house cat, yellowish brown to grayish brown above, the crown, neck and mid-line of the back bright ferruginous; two short white lines from the inner corner of the eyes continue as dull gray lines to the top of head; a white line from just below the eye to side of neck, bordered above and below by russet and black; backs of ears black mixed with gray centrally; a clear gray patch behind ear; feet grizzled gray; tail like the back, with a black tip and whitish lower median line; belly whitish with a row of dark spots on each side.

Four handsome specimens of this cat were secured by Pope in northwestern Fukien. Its range no doubt is more or less continuous across the wooded mountainous parts of southern China to Nepal and the Malay Peninsula. The type locality of *F. temmincki* is Sumatra but no comparisons seem to have been made between Sumatran specimens and those of China, though Lönnberg has shown that a skull from northern Siam is

practically identical in measurements with one from China. An adult skull from Nepal is slightly smaller with more inflated bullæ.

Lydekker in 1908 gave the name *Felis temminckii mitchelli* to the animal of Szechwan on the basis of a single skin, and in 1924 Sowerby described a specimen from Tengyueh, Yunnan, as *F. t. bainesi*. In view of the variation in color among cats, and the fact that the species, like *F. aurata* of West Africa, believed to be closely related, occurs in a rufous and a browner phase, it is likely that these are not valid races. Matschie's *Felis (Catopuma) melli* is undoubtedly a synonym of *F. t. dominicanorum*, as well as *F. t. badiodorsalis* A. B. Howell, proposed in place of *melli*, preoccupied.

In addition to the four typical specimens secured at Kuatun, Fukien, by Mr. C. H. Pope, he obtained a fifth (an adult female) from the same locality which agrees in size and in cranial characters with these but differs remarkably in that, instead of being without markings on the body, it has a distinct color pattern of stripes and spots. Like usual skins of *temmincki*, it has black ears, slightly grizzled with gray in the middle of their posterior side, a clear gray patch behind each ear, grizzled gray feet, and bright ferruginous shoulders and mid-dorsal area. The head and body, however, are marked with a pattern practically identical with that of *Felis bengalensis*. There are two narrow lines of black down the back with a less clearly marked pair external to them, then about four rows of elongate blotches and spots, each with an ochraceous center incompletely ringed by a broken black margin, heavier at the posterior side. A row of blackish spots is present on each side of the belly. The tail, in addition to the usual pattern of ferruginous above, white below, with a black tip, also has about fifteen black bars, much as in the smaller species. At first sight, this animal might be thought a hybrid between *F. t. dominicanorum* and *F. b. chinensis*, both of which occur together here, although the latter is commoner at lower altitudes, but it seems equally probable that it represents either a reversion to a more primitive striped and spotted condition or a retention of the pattern that is probably characteristic of babyhood.

Felis nebulosa Griffith

Felis nebulosa Griffith, 1821, 'Descr. Vert.,' p. 37.

Size of a leopard; the grayish-ochraceous ground color has some four or five large blotches on the sides, each outlined in black, forming a rim that is narrower or broken on the anterior side; forehead with many small black spots; two pairs of black stripes from occiput to shoulders,

whence the median pair continues more or less broken on to the base of tail; belly white with elongate blackish spots.

A skin from Yenping, Fukien, and another, smaller with the black marks less developed, from Hainan, represent this species. The slight differences in color and pattern are probably individual, and since Griffith's type was an animal supposed to have come from near Canton, the Fukien skin may be regarded as typical, and Matschie's *Felis* (*Neofelis*) *melli* from Kwangtung a synonym. Material is lacking to determine the status of the Sumatran animal to which Horsfield gave the name *F. macrocelis*.

Felis pardus perniger (Hodgson)

Leopardus perniger Hodgson, 1863, 'Cat. Mamm. Nepal,' p. 3.

The type locality of Linnæus's *Felis pardus* has been fixed by Thomas as Egypt, and Hollister shows that skins from the southern part of that country are ochraceous buff, hence somewhat pallid, in ground color. African leopards seem to be either large-spotted or small-spotted, the latter perhaps the more usual condition. The series of eleven from Fukien and eastern Szechwan, secured by the Asiatic Expeditions, are uniformly rich ochraceous in ground color, with a pattern of large spots. There is a spinal series of large black spots forming two rows, while laterally the spots become more nearly circular, either with ochraceous centers completely ringed, or with the rings broken anteriorly or in two or three places. Immature specimens are paler in color than adults.

Although various names have been given to leopards in the East, it can hardly be said that any of them rests upon a satisfactory basis. Cabrera has pointed out that Hodgson's *Leopardus perniger*, based on a melanistic individual from Nepal, is the oldest name available for an Indian leopard, and since it is likely that the animal of South China is the same, I am provisionally using it for the latter. Three leopard skulls from India (two from Amballa) are a little different in the form of the nasals from the Chinese series, in which these bones are slightly more flattened and triangular, tapering to a median point behind instead of maintaining their width farther back and ending in an abruptly rounded outline. These differences are slight, however, and may not hold in a larger series of Indian skulls. Other available names for the eastern leopard are: *melas* of Péron and *variegata* of Temminck, both based on specimens from Java, Matschie's *Panthera hanensis* based on skins from Hing-an-fu and *Felis pardalis sinensis* of Brass applied to leopards of South China. The likelihood is, however, that the latter do not materi-

ally differ from Indian examples. Although specimens from North China are not available to determine the validity of the race currently called *fontanieri* (type locality Peking), Cabrera has suggested that the name *orientalis* of Schlegel (type from Amur) may be found applicable to it instead.

Felis tigris Linnæus

Felis tigris Linnæus, 1758, 'Syst. Nat.,' 10th Ed., I, p. 41.

Three handsome tiger skins with skulls, from Fukien Province, do not seem to differ essentially from the only Indian tiger available for comparison. The three are similar in their rich tawny ground-color, but differ in the details of the black stripes. In the adult male, No. 45519, the body stripes are broad, and much broken into lozenge-shaped blotches, with wide borders enclosing a bright rufous center. The stripes on the hips and haunches are, however, clear, wide, and continuous. A second skin shows the opposite extreme, with very narrow stripes, much less broken over the body, but tending to be short or incomplete; while the third is somewhat intermediate, with the stripes more broken and tending to form blotches open on the anterior upper part, enclosing areas of tawny. Hilzheimer (1905, Zool. Anz., XXVIII, p. 594), in comparing five Chinese tiger skulls with three from India, believed that the Chinese skulls could be distinguished by having the highest point of the skull just ahead of the postorbital processes instead of over them, and by lacking a small antero-external supplementary cusp on the upper carnassial, present in Indian skulls. These differences do not seem to hold good, however, for in the three skulls from Fukien the highest point is behind the postorbital process in one, ahead of it in the two others, while the supplementary cusplet of the upper carnassial is well developed in the large male, slightly devcloped in the second specimen and not at all in the third. Hilzheimer, relying on the report of an expert fur dealer, believed that there are differences in pelage between the Indian and the South China tigers, but it seems doubtful if these are of recognizable value in nomenclature, so that for the present Hilzheimer's name *amoyensis* for the tiger from Yunnan to Fukien may be regarded as probably a synonym. Following Pocock, I retain the generic name *Felis* for the tiger and the leopard, although both may be included in a subgenus, *Panthera*.

Lynx lynx isabellina (Blyth)

Felis isabellina Blyth, 1847, Journ. Asiatic Soc. Bengal, XVI, p. 1178.

A large short-tailed cat, of a general frosted reddish above, white below with a few blackish spots on inner side of fore limbs and on the

sides of belly; legs and flanks with indistinct reddish spots; a broad white border to the eyelid, interrupted by a black spot near posterior upper margin; cheeks with three or four indistinct stripes of reddish brown; upper half of ear, its terminal pencil, a black spot on the lower cheek, and the tip of the tail, black.

A large skin from fifteen miles northeast of Urga, Mongolia, is interesting as perhaps marking nearly the southern boundary of this lynx's range in this part of Mongolia, where the coniferous forest and its northern fauna reach the edge of the Gobi Desert.