

certain distance southward into the area in which *minimus* is the dominant form. But all this is precisely what we must expect, in view of the fact that these races do not occupy isolated (insular) localities, but the central and southern part of one continuous land area.—Very likely there is also in W. Asia a certain region in which both forms or intermediate examples occur (see the female from S. Caucasus, which I have referred to *hipposiderus*, but which has the minimum size of this race).

From France and the whole of the Balkan Peninsula S. of Rustshuk we completely lack information; it would be particularly interesting to know whether French specimens are *hipposiderus* or *minimus*, or, possibly, identical with the British form, *minutus*.

I should not have taken the trouble to give the proofs—once more, and in a much more detailed form—of the existence in continental Europe of two well-marked races of the Lesser Horseshoe Bat were it not for the following reason:—It is a matter of course that on the basis of the collection in one single Museum—be such collection even so rich as that of the British Museum—it is impossible to give more than a rough sketch of the range of these two races of *Rh. hipposiderus*; the working out of the details must be left to the local naturalists interested in the subject. But the stimulus to do such useful work is naturally taken away, or greatly weakened, when a writer, claiming to base his conclusion on a careful examination of an unusually large series of specimens, declares that he cannot see that the supposed racial difference is anything but a difference between male and female of the same species. To show that this opinion is entirely wrong is the object of these lines. Naturalists may safely take it as an established fact that these two races do exist; what we want to know now is, (1) the exact area occupied *exclusively* by the one or the other form, and (2) the area where both of them *occur together*. This latter is the transitional zone between the regions inhabited by the two races.

L.—*Some new European Insectivora and Carnivora.*

By GERRIT S. MILLER.

IN the course of some studies of the European mammal fauna, undertaken at the invitation of Mr. Oldfield Thomas, I have found the following hitherto unnamed Insectivora and Carnivora.

Crocidura russula cintræ, subsp. n.

Type.—Adult male (skin and skull). B.M. no. 98. 2. 2. 11. Collected at Cintra, near Lisbon, Portugal, January 26, 1896, by Oldfield Thomas. Original number 47.

Diagnosis.—Smaller than true *Crocidura russula* (hind foot 11·4–12·2 mm. instead of 11·7–14; condylo-basal length of skull 17·8–19·2 instead of 18–20·4); colour dark and rich, in striking contrast with the pallid tints of the Spanish *C. r. pulchra*, Cabrera, and with a strong coppery lustre rarely indicated in the typical race.

Colour.—Type: upperparts between the mars-brown and russet of Ridgway, very faintly darker along middle of back, the hairs everywhere with metallic coppery and silvery reflections. Underparts and feet pale wood-brown. Tail a dull indefinite broccoli-brown, darker above than below.

Skull and teeth.—Except for their smaller size the skull and teeth resemble those of true *russula*.

Measurements.—Type: head and body 64 mm.; tail 33; hind foot 11·4; ear 8·6; skull, condylo-basal length 18; width of brain-case 9; depth of brain-case 4·8; mandible (including incisors) 11·8; upper tooth-row 8·6.

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

Remarks.—In its small size the Cintra shrew agrees with the Spanish race, but the colour is conspicuously darker. The skins show no specially noteworthy variations, though in a few individuals the fur is less glossy than usual. Taken as a whole the series is about as dark as in French and Belgian *russula*; but the peculiar coppery lustre is highly characteristic of the Portuguese form.

Crocidura cyrnensis, sp. n.

Type.—Adult male (in alcohol). B.M. no. 6. 3. 14. 1. Bastia, Corsica. Collected and presented by E. R. Southwell, Esq.

Diagnosis.—Smaller than the Sicilian *Crocidura caudata* (hind foot 12–12·4 mm. instead of 14 mm.); tail relatively about as long as in *caudata*, but not unusually thickened (its ratio to head and body about 70, its diameter at middle 2 mm. instead of 3 mm.).

Colour.—Upperparts broccoli-brown slightly washed with sepia, the slate-grey bases of the hairs showing through at surface and producing a general effect nearly the drab of Ridgway. Most of the hairs with faint silvery reflections in certain lights. Underparts and feet light smoke-grey.

Skull and teeth.—No perfect skull has been seen, but there are apparently no special cranial peculiarities. Teeth essentially as in *C. russula*.

Measurements.—Type: head and body 67 mm.; tail 48; hind foot 12·4; ear 10; skull, from front of incisor to back of glenoid fossa 11·6; mandible (including incisor) 11·6; upper tooth-row 8.

Specimens examined.—Two, the type, and a skin from La Foce de Vizzavora, presented by Col. J. W. Yerbury.

Crocidura balearica, sp. n.

1901. *Crocidura russula*, Thomas, Proc. Zool. Soc. London, i. p. 39.

Type.—Adult female (skin and skull). B.M. no. 0. 7. 1. 42. Collected at San Cristobal, Minorca, Balearic Islands, April 7, 1900, by Oldfield Thomas and R. I. Pocock. Original number 263.

Diagnosis.—Similar to *Crocidura cyrnensis*, but teeth much smaller.

Colour.—Type: above hair-brown tinged with sepia, the hairs nearly without metallic reflections; below dull smoke-grey. Feet and tail a dull, indefinite brownish, the tail scarcely lighter below.

Skull and teeth.—Except for the smaller teeth there appear to be no cranial or dental peculiarities to distinguish the species from *C. cyrnensis*.

Measurements.—Type: head and body 42 mm.; tail 45; hind foot 12·5; ear 9; distance from front of upper incisor to back of second molar 7·4.

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

Remarks.—This species, *C. cyrnensis*, *C. caudata*, and *C. cypricæ* (Bate) form a group, of which no continental member is yet known, characterized, as compared with *C. russula*, *C. leucodon*, and *C. mimula*, by the noticeable elongation of the tail.

Vulpes ichnusæ, sp. n.

Type.—Adult male (skin and skull). B.M. no. 88. 12. 1. 2. Collected at Sarrabus, Sardinia, February 26, 1885, by G. B. Travers, and presented by the Marquis G. Doria.

Diagnosis.—Size less than in any of the known continental members of the *Vulpes vulpes* group; both hind foot and condylo-basal length of skull less than 130 mm. in adult male, ear from crown only 60–70 mm., colour rather dark.

Colour.—Face and head dark rufous, becoming lighter and more dull on base of ears and on neck, and fading to

ochraceous-rufous on shoulders and back. Sides of neck, outer surface of upper arm, and region just behind axillæ a tawny buff. Underfur of back drab-grey at base, tawny clay-colour at tip. Longer hairs of head, sides, and back (behind shoulders) much speckled by the presence of a buffy white subterminal area (about 5 mm. long) on each hair; extreme tips reddish. Feet and legs ochraceous-rufous, slightly clouded with blackish and a little speckled with buffy white. Tail like back at base, the ochraceous-rufous gradually fading through a buffy grey to the whitish buff tip, the longer hairs everywhere except at tip with 30-40 mm. black terminal area. Underparts in front of fore legs buffy white tinged with hair-brown, the latter becoming nearly clear on middle of throat. Rest of underparts a mixture of hair-brown and dull tawny, the latter predominating laterally.

Skull and teeth.—Except for their smaller size the skull and teeth are essentially as in *Vulpes vulpes*.

Measurements.—Type: hind foot 123 mm.; ear from crown 70; skull, condylo-basal length 129; zygomatic breadth 78; mastoid breadth 47; rostral breadth over canines 22; depth of brain-case 41; frontal depth at last molar 33; rostral depth behind canine 17; mandible 100.4; maxillary tooth-row 59; mandibular tooth-row 65.4.

Specimens examined.—Two, both from Sardinia.

Remarks.—While the Sardinian fox is readily distinguishable from its continental allies by its small size, it closely agrees in this respect with the small fox of Crete. It retains, however, the usual dark, bright coloration of the ordinary European animals, while in the Cretan fox the rufous parts are faded to ochraceous buff.

Vulpes indutus, sp. n.

1904. *Vulpes vulpes*, Bate, Proc. Zool. Soc. London, 1903, ii, p. 345 (April 1, 1904).

Type.—Adult (skin only). B.M. no. 3. 12. 4. 25. Cape Pyla, Cyprus (*Miss D. M. A. Bate*).

Diagnosis.—Similar to the small *Vulpes ichnusæ* of Sardinia, but general colour paler (face ochraceous-buff instead of dark rufous, sides dull yellowish buff instead of tawny buff) and legs grizzled blackish in strong contrast with colour of sides.

Colour.—Face and head ochraceous-buff, becoming lighter and more buffy on base of ears and fading to dull yellowish buff on neck and body. Underfur of back a slaty grey at base, becoming nearly russet at tips of hairs, this darker

colour appearing at surface from between ears to base of tail and over thighs and shoulders. Longer hairs of head, sides, and back with broad subterminal light area, buffy on neck and back, dull whitish on flanks and sides, the extreme tips blackish. Legs a grizzle of blackish and whitish in strong contrast with colour of sides, the inner surface washed with dull ochraceous. Feet blackish, the hind foot much suffused with dull ochraceous. Tail buffy clay-colour, the tip nearly white, most of the hairs, except at tip, black terminally, and those of underside with a whitish subterminal area. Underparts to fore legs buffy white, clouded by the dark underfur and becoming buff on inter-ramia and dusky on tips. Behind fore legs the clouded whitish extends as a narrow median area between the clear dull buff of lateral portions of underparts.

Skull and teeth.—The skull is conspicuously smaller than that of *Vulpes vulpes*, in this respect agreeing with that of *V. ichnusæ*. It resembles the latter also in its greater relative breadth as compared with skulls of mainland foxes. The teeth show no special peculiarities.

Measurements.—Type: ear from crown 62 mm. (in two other specimens 65 and 68). Skull of adult (probably male), from type locality, No. 3. 12. 4. 26: condylo-basal length 123; zygomatic breadth 73.4; mastoid breadth 42.6; rostral breadth over canines 22.6; depth of brain-case 38; depth behind last molar 31.6; rostral depth behind canine 16.4; mandible 97; maxillary tooth-row exclusive of incisors 55.4; mandibular tooth-row exclusive of incisors 63.4.

Vulpes vulpes silaceus, subsp. n.

Type.—Adult male (skin and skull), collected near Silos, Province of Burgos, Spain, January 1907, by the Rev. Father Saturio Gonzalez. Original number 1.

Diagnosis.—Like *Vulpes vulpes vulpes* of Central Europe, but with the reddish tints mostly replaced by buffy and greyish.

Colour.—Head and face tawny-ochraceous, becoming a yellowish ochraceous-buff behind ears and brightening to a dull rufous about eye and between eye and base of whiskers; upper surface of muzzle ochraceous-buff; forehead from level of front of eyes, and cheeks behind eyes, strongly suffused with creamy white, this becoming less evident between ears and disappearing entirely on ochraceous-buff area behind ear; hairs of outer margin and inner surface of ear pale cream-buff, those of inner margin light buff; back of ear with the

usual blackish area; back a coarse mixture of black, creamy white, and russet, the black predominating along middle of neck and between shoulders, the russet along median line of back; on sides the black nearly disappears, and the russet changes to a light ochraceous-buff which becomes nearly clear (that is, scarcely overlaid with creamy white) around base of fore leg and on shoulder nearly to median line of back; legs a tawny ochraceous-buff noticeably darker than that of sides, the hairs on outer surface rather conspicuously black-tipped; feet somewhat yellower than legs, the upper surface strongly washed with black; tail a light buffy grey, tinged with a tawny ochraceous-buff like that of legs above, whitish at extremity, the longer hairs everywhere (except at tip) with terminal 20–30 mm. black, the dark clouding thus produced most noticeable on lower surface; underparts dull whitish, everywhere clouded with slaty black, this most conspicuous on throat and along middle of chest.

Skull and teeth.—Essentially as in the fox of Central Europe.

Measurements.—Type: head and body 750 mm.; tail-vertebræ 370; hind foot 150; skull, condylo-basal length 143; zygomatic breadth 78; mastoid breadth 48·8; rostral breadth over canines 24; depth of brain-case 41; depth behind last molar 35·4; rostral depth behind canine 17·6; mandible 99; maxillary tooth-row, exclusive of incisors, 65; mandibular tooth-row, exclusive of incisors, 73.

Specimens examined.—Nine, from the following localities in Spain: *Province of Vitoria*, Arrechavaleta, 1; *Province of Burgos*, Silos, 1; Palacios, 1; vicinity of Burgos, 1; *Galicja*, Forreo del Allo, 1; *Province of Seville*, vicinity of Seville, 3; *Province of Alicante*, Elche, 1.

Meles arcalus, sp. n.

1899. *Meles meles mediterraneus*, Barrett-Hamilton, Ann. & Mag. Nat. Hist. (7) iv. p. 131 (November 1899) (part.).

1906. *Meles meles mediterraneus*, Bate, P. Z. S. 1905, ii. p. 318 (April 5, 1906).

Type.—Young female (skin and skull). B.M. no. 5.12.2.17. Collected on the Lasseth Plain, Crete, by Miss D. M. A. Bate. Original number 25.

Diagnosis.—Smaller and paler than in the ordinary European badgers (upper length of skull in adult less than 110 mm.; maxillary tooth-row, exclusive of incisors, about 35 mm.); auditory bullæ not flattened, their form as in the Caucasian *Meles minor* (Satunin).

Colour.—The colour so closely resembles that of the common badger as to need no detailed description. It is, however, somewhat paler than in true *Meles meles*, agreeing in this respect with the Spanish *M. m. mediterraneus*.

Skull.—In general form the skull appears to agree with that of *Meles meles* (no perfect adult skulls examined), though it is readily distinguishable by its smaller size (upper length in adult 107 instead of 124–137 mm.) and by the form of the audital bullæ. These are strongly inflated, the highest region near middle of bulla proper (exclusive of meatal tube) and so broadly rounded as to show no longitudinal ridge, the region between highest portion and meatus not noticeably concave. Their form resembles that in the much larger *Meles minor* (Satunin) as figured in the original description* and as represented by specimens collected by Mr. A. Robert in the neighbourhood of Trebizond.

Teeth.—The teeth are smaller than those of *Meles meles*, and the smaller cusps tend to be better developed, but otherwise they show no special peculiarities except that the postero-external border of the upper molar appears to be more strongly concave than usual in *M. meles*. The material at hand is, however, not sufficient to show whether this character is constant.

Measurements.—Type: hind foot 80 mm.; ear from crown 17 (both from dry skin): skull, condylo-basal length 100; upper length 105 (107)†; distance from anterior rim of orbit to gnathion 36 (38·6); zygomatic breadth 55·6; mastoid breadth 48·6; depth of brain-case at front of basi-occipital 36; mandible 68; maxillary tooth-row, exclusive of incisors, 36 (36·8); mandibular tooth-row, exclusive of incisors, 42·6; mandibular molars (crowns) 20·4.

Specimens examined.—Three, all from Crete.

Putorius erminea ricinæ, subsp. n.

1904. *Putorius erminea*, Barrett-Hamilton, Annals of Scottish Natural History, p. 203 (October 1904).

Type.—Adult male (skin and skull). B.M. no. 7.10.19.1. Collected at Islay House, Island of Islay, Scotland, February 6, 1896, by P. Mackenzie. Presented by Hugh Morrison, Esq.

Diagnosis.—Size less than in *Putorius erminea stabilis* of Southern England (hind foot in adult females 35 to 40 mm.).

* Mitteilungen des Kaukasischen Museums, ii. (1905), pl. i. 1906.

† Measurements in parentheses are those of an imperfect adult skull without exact locality.

instead of 38 to 44 mm.) ; skull with zygomatic arches very wide-spreading, the ratio of zygomatic breadth to condylo-basal length ranging from 58 to 60 instead of from 53 to 57.

Measurements.—Type: head and body 254 mm.; tail 105; hind foot 43; skull, condylo-basal length 47; zygomatic breadth 24·2; mastoid breadth 23·2; occipital depth to lip of foramen magnum 13; frontal depth behind tooth-row 13·2; mandible 26·8; maxillary tooth-row, exclusive of incisors, 12; mandibular tooth-row, exclusive of incisors, 15.

Specimens examined.—Seven from Islay and six from Jura, the latter kindly placed at my disposal by Mr. Harmer, of the Cambridge Museum.

Felis grampia, sp. n.

Type.—Young adult male (skin and skull). B.M. no. 4. 1. 25. 3. Invermoriston District, Inverness, Scotland, January 16, 1904. Presented by A. H. Cocks, Esq. Original number 60.

Diagnosis.—Similar to *Felis silvestris*, Schreber, but darker (the general effect of back and sides broccoli-brown instead of smoke-grey) and with black markings more extensive and better defined.

Colour.—Underfur of back and sides a light ochraceous-buff, the basal half of the hairs mouse-grey. Light annulations of longer hairs very nearly the cream-buff of Ridgway. Black tips to longer hairs more noticeable than in *Felis silvestris*, and general effect of ground-colour distinctly browner and with no trace of the frosted appearance often very noticeable in the continental animal. Upperside of feet and inner surface of hind legs ochraceous-buff, becoming duller and somewhat drab-tinged on underside of body. Pectoral and intercrural white areas well defined and strongly contrasted with surrounding colour. Black spotting on middle of chest conspicuous. Soles and palms blackish. Dark markings on tail, legs, and upperparts similar to those of *Felis silvestris* in arrangement, but more definite in outline, particularly the transverse stripes on outer side of fore legs and those on posterior half of body, the latter nearly always appearing as definite stripes.

Skull and teeth.—As in *Felis silvestris*.

Measurements.—Type: head and body 534 mm.; tail 338; hind foot 127; skull, condylo-basal length 87; zygomatic breadth 66; mastoid breadth 43·8; postorbital constriction 34·6; interorbital constriction 18·6; breadth of rostrum over

canines 25; depth of brain-case 37; frontal depth behind tooth-row 31.4; rostral depth behind canine 16; mandible 63; maxillary tooth-row, exclusive of incisors, 29.6; mandibular tooth-row, exclusive of incisors, 32.4.

Specimens examined.—Eleven, all from Scotland.

Felis tartessia, sp. n.

Type.—Adult male (skin and skull). B.M. no. 7. 6. 4. 1. Coto Doñana, near Jerez de la Frontera, Spain. Collected and presented by B. F. Buck, Esq.

Diagnosis.—Larger and darker than *Felis silvestris* and with conspicuously larger teeth.

Colour.—The colour is noticeably darker than in *Felis silvestris*, scarcely or not distinguishable from that of *F. grampius*. Underfur more slaty at base than in the two related species, about the grey No. 6 of Ridgway, its terminal portion a dull cream-buff. Pale annulations of longer hairs nearly as light as in *F. silvestris*. Inner surface of hind legs a light ochraceous-buff; rest of underparts as in *F. grampius*. Dark markings well defined, their arrangement and extent as in the British Wild-cat.

Skull.—In fully adult males the skull is very large, apparently exceeding that of any of the other members of the group. The form is not peculiar.

Teeth.—While in form the teeth show no peculiarities their size immediately distinguishes them from those of other members of the group, including the domestic cat. This is particularly noticeable in the premolars both above and below. In the three skulls examined (two males and one female) the length of the posterior two upper premolars together is 19.8 mm., while in fifteen skulls of *F. silvestris* and *F. grampius* it ranges from 16.6 to 18.8. The combined length of the three lower cheek-teeth in the three Spanish cats ranges from 23.4 to 23.6, while in the fifteen northern specimens the extremes are 18.8 and 21.2.

Measurements.—The specimens were not measured in the flesh, but the hind foot and tail both appear to be longer than in the northern forms. Skull of type: condylo-basal length $93 \pm$ mm.; zygomatic breadth 76.4; mastoid breadth 47.2; postorbital constriction 33; interorbital constriction 21.6; breadth of rostrum over canines 29; frontal depth behind tooth-row 33; rostral depth behind canine 20.4; mandible 69; maxillary tooth-row, exclusive of incisors, 33; mandibular tooth-row, exclusive of incisors, 35.4.

Specimens examined.—Three, the type and two others (probably from the type locality).

Lynx pardella, nom. nov.

1824. *Felis pardina*, Temminck, Monogr. de Mamm. i. p. 116. Not *Lynx pardina*, Oken, 1816.

Type.—Adult female (skin and skull). B.M. no. 4. 12. 12. 2. Coto Doñana, near Jerez de la Frontera, Spain. Collected and presented by Abel Chapman, Esq.

In applying the well-known name *Lynx pardina* to the Spanish lynx the fact has been overlooked that Temminck took his specific name from Oken, or at least that he supposed his animal to be the same as that of the earlier author. Oken's *Lynx pardina* was a striped cat from "Turkey and Barbary"*, so that, whatever the true identity of the species, it cannot have been the spotted lynx of Spain.

The material in the British Museum shows that two colour-patterns occur among Spanish lynxes, in one of which, apparently the more usual, the spots on the back and sides are small, mostly about 10 mm. or less in diameter, the rows indistinct, but containing evidently more than 25 spots between shoulder and base of tail; while in the other the spots are larger and more distinct, many of them 20 mm. in diameter, the rows containing only about a dozen spots between shoulder and base of tail. From the skins at hand it is impossible to determine the status of these two forms, though the similarity of their skulls indicates that they are merely colour-phases of a single species. To avoid any possible ambiguity I have designated a type specimen for this new name, and have selected for this purpose a skin showing the better-known, small-spotted type of coloration. Temminck's animal came from the neighbourhood of Lisbon, Portugal, but to which of the two phases it belonged the description gives no clue.

LI.—Two new Forms of the Spanish Hare.

By GERRIT S. MILLER.

THE series of fifteen specimens of the Spanish Hare in the British Museum shows that this strikingly characterized species † is represented by three readily distinguishable forms, which may be briefly defined as follows:—

* "In der Türkei und Barbarei . . . rothbraun, Bauch falb, Gurgel weiss, überall voll schwarzer Streifen oben, Flecken unten, auf Ohren solche Querstreifen." (Oken, Lehrbuch der Zoologie, iii. Th. ii. Abth., p. 1051.)

† For a full discussion of the status of the Spanish Hare, see de Winton, Ann. & Mag. Nat. Hist. ser. 7, i. p. 153 (February 1898). The name



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