

Dr. Forsyth Major also exhibited photographs of Pliocene *Bovinae* from specimens in the Florence Museum, stating that these unpublished figures showed the great variability of the Pliocene *Bovinae*. He added that he endorsed Falconer's opinion that these Pliocene *Bovinae* were nearly related to the primitive Buffaloes from the Siwaliks.

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The following papers were read :—

1. The Duke of Bedford's Zoological Exploration in Eastern Asia.—X. List of Mammals from the Provinces of Chih-li and Shan-si, N. China. By OLDFIELD THOMAS, F.R.S., F.Z.S.\*

[Received May 2, 1908.]

(Plate XXXII.)

During the four months following his excursion to the Mongolian plateau †, Mr. M. P. Anderson made collections in different parts of the northern provinces of China, Chih-li and Shan-si, and it is an interesting comment on our ignorance of the Fauna of that part of the world that, in spite of the previous work of David, Swinhoe, Styan and others, he has obtained quite a number of new forms.

Throughout the region, the country has proved to be extremely barren and poor in mammals, and the possible collecting-grounds few and far between. But this very fact renders such collecting places as Mr. Anderson has found all the more interesting, for they almost bear the character of faunistic islands, in which the original inhabitants have been locally preserved, and which are separated from each other by a sea of barren treeless plains where few animals can live. The proper exploration of these oases of life is therefore peculiarly valuable. No doubt the difficulties of collecting have been accentuated during the winter months, and we may hope that during the present spring Mr. Anderson will find a number of additional forms which in the winter have been lying dormant.

Of previous literature there is not much to be referred to beyond the well-known publications of David, Milne-Edwards, and Swinhoe, and an interesting paper by O. F. von Möllendorff ‡ giving a popular account of the Mammals of Chih-li, with notes on the Chinese names.

\* [The complete account of the new species described in this communication appears here; but since the name and preliminary diagnosis of one were published in the 'Abstract,' that species is distinguished by the name being underlined.—EDITOR.]

† *Supra*, p. 104.

‡ "The Vertebrata of the Province of Chih-li, with Notes on Chinese Zoological Nomenclature," Journ. N. China Branch Roy. As. Soc. (2) xi. p. 41, 1877.

Prof. Matschie's work\* on the Filchner Mammals deals with a somewhat different region, further to the west and south, but, true to his peculiar creed that the animals of different river-basins must be specifically distinct from each other, the author gives new names to some of the Chih-li mammals. The material he worked upon seems to have consisted largely of single purchased skins, mostly without skulls, and the possibility of any such variation in colour as is found in the Shan-si foxes (see *infra*) is entirely ignored.

No less than 19 species are described as new by Prof. Matschie on undated skins without measurements or skulls, or at least without mention of the latter, and I cannot refrain from expressing the opinion that such work is neither worthy of the high standing of the Berlin Museum nor of the present date, when pains are being taken in all directions to ensure that mammal work should be based only on proper and carefully collected material. The Americans have set us a good example in this respect, and it is to be regretted that work issuing from the Berlin Museum should be done in so retrograde a manner. All the names thus founded will remain an incubus to science until the time when they can be successively examined and weighed in the light of complete material, such material, for instance, as the Washington Museum has received from Dr. W. L. Abbott, or our own National Museum owes to the Duke of Bedford, Mr. C. D. Rudd, Mr. W. E. Balston, and many others.

About 100 specimens are dealt with in the present communication, belonging to 20 species.

The following are Mr. Anderson's notes on the localities he collected in :—

#### CHIH-LI.

"After returning from my trip to the Mongolian Plateau, I visited Tung-ling, the forest of the reserve of the Eastern Imperial Tombs, and on 12th September, 1907, I began work at Yen-mon, a hamlet about 65 miles north-east of Peking. At this point I was well within the hills which border the Chih-li plain on the north, and my hamlet was at an altitude of about 1000 ft., while the surrounding hills rose to 1800 or 2000 ft. The hills of this region are for the most part very abrupt, rugged and rocky. Difficult peaks and narrow, almost impassable canyons are frequent. Tung-ling is forbidden ground to the wood-cutter and charcoal-burner, therefore woods persist and even grow dense and old in the remoter parts of the reserve. One finds some fine oaks, walnuts, chestnuts, and cottonwoods. The frequently occurring open spaces are well covered with deep grass."

#### SHAN-SI.

"On 25th October, 1907, I reached Tai-Yuen-Fu, the capital

\* Filchner Exped. Zool. pp. 134-244, 1907 (postdated 1908).

of Shan-si Province, and on 31st October left that city for the mountain-range some 15 miles west of there.

"At this point, at an altitude of 5400 feet, I found the mountains sparsely covered with pine trees and the canyon sides overgrown with dense bushes.

"On 17th November I began work at Chao-Cheng-Shan, a mountain of 10,000 ft. altitude, situated about 100 miles west-north-west of Tai-Yuen-Fu. There, at an altitude of 8000 ft., I made my home in a peasant's hut. Above me extended a dense forest of spruce and hemlock, below I overlooked the rugged bare hills and cultivated valleys characteristic of North China.

"I remained in this place till Dec. 6th, 1907. The weather throughout was fiercely cold, as a north wind blew almost unceasingly.

"On December 27th I went eastward of Tai-Yuen-Fu about 20 miles to a temple wood among the 'loess' hills. But this proved such a poor collecting-ground, and the weather so very cold, that on 4th January I thought it advisable to return to the city."

1. RHINOLOPHUS FERRUM-EQUINUM NIPPON Temm.

♂. 1571. Cave 30 miles W. of Peking. 600'.

This and the two following species were obtained in a sacred cave which Mr. Anderson might not have been allowed to enter, certainly not to shoot in, had it not been for the kind offices of Dr. J. H. Ingram of Tung-chou, who persuaded the priest of the cave to allow him to do so. Great numbers of bats were hanging from the roof, but besides the one *Rhinolophus*, which was caught low down within reach, and the two specimens of *Myotis*, all proved to belong to one species, a *Miniopterus*.

2. MYOTIS (LEUCONOE) PEQUINIUS, sp. n.

♂. 1573, 1589. Cave 30 miles W. of Peking. 600'.

A comparatively large *Leuconoe*, with a fringed interfemoral membrane.

In size one of the largest species of the group, exceeding all the Old-World species of *Leuconoe*, except *M. ricketti*. Fur rather short and velvety, hairs of back about 5 mm. in length. General colour above uniform "drab-grey," the bases of the hairs slaty. Under surface whitish grey, the ends of the hairs nearly white, their bases slaty; under side of hind legs and the anal region edging the membranes white and practically hairless. Ears of medium size, rather narrow, concave on their external border; tragus about half the length of the ear, narrow, not sharply pointed, slightly curved outwards above. Wings attached to the lower end of the tibiae. Feet of average *Leuconoe* proportions. Interfemoral membrane fringed posteriorly with pale buffy hairs; tip of tail not projecting from the membrane, so far as can be

determined on skins from which the caudal vertebræ have been pulled out. In colour all the membranes and the feet are dark drab-grey, except that the terminal half-inch of the interfemoral is slightly marbled with white.

Median upper premolar minute in one specimen, absent in the other, but both are very old examples with the teeth much worn down. Also very minute in the lower jaw.

Dimensions of the type (the starred measurements taken in the flesh):—

Forearm 50 mm. (in the second specimen 48·5).

\*Head and body 62 mm.; \*tail 42 †; \*hind foot (s. u.) 12; \*ear 18; tragus on inner edge (dry) 7; third finger, metacarpal 46, 1st phalanx 14·5, 2nd phalanx 14; tibia 18.

Skull—basi-sinual length ‡ (c.) 14·5 mm.; zygomatic breadth 12·2; interorbital breadth 4·9, breadth of brain-case 4·7; front of canine to back of m<sup>3</sup> 6·9.

*Hab.* China, 30 miles W. of Peking. Alt. 600'.

*Type.* Old male. B.M. No. 8.8.7.2. Original number 1573. Collected 11 October, 1907.

By its size and the presence of a fringe on its interfemoral membrane this very distinct Bat is easily separable from any known Asiatic member of the genus *Myotis*.

The specimens were found hanging in the same cave as the series of *Miniopterus*—the association recalling that so frequent in Europe of *Miniopterus* with *Myotis* (*Leuconoe*) *capaccinii*.

### 3. MINIOPTERUS SCHREIBERSI CHINENSIS, subsp. n.

2 ♂, 13 ♀. 1574–1588. Cave 30 miles W. of Peking. 600'.

Size averaging slightly larger than in *M. s. japonica* Thos., the forearm ranging in length from 47 to 50 mm.

Colour dark, as usual in the Eastern forms, but without the reddish “Prout's brown” suffusion found in *japonica*, the general tone being markedly more drabby than in that form. The colour cannot be exactly matched in Ridgway, but is between “seal-brown” and “drab,” with something of each in it according to the light the specimens are seen in.

This difference in colour is perfectly uniform throughout series of fifteen specimens of *chinensis* and a dozen of *japonica*, so that it seems necessary to recognise the N. China form as a different subspecies from that of Japan.

Dimensions of the type, measured in the flesh:—

Forearm 49 mm.

Head and body 62 mm.; tail 52; hind foot 10·5; ear 12.

Skull—greatest length 15·8 mm.; basi-sinual length 12.

† Probably below the normal; in the other specimen 49 mm.

‡ In describing Bats a name is frequently wanted for the measurement from the basion to the hinder edge of the anterior palatal notch. As the Latin for notch, *incisio*, makes a compound too like one founded on the incisor teeth, I would suggest the above word, based on *sinus*, a bay or gulf, with which this deep rounded hollow may be suitably compared.

*Type.* Adult female. B.M. No. 8.8.7.15. Original number 1585. Collected 11 October, 1907.

Bonhote's *M. s. fuscus* from the Liu-Kiu Islands is smaller, with a forearm about 44 mm. in length.

#### 4. *CROCIDURA COREÆ* Thos.

♂. 1553. Imperial Tombs, 65 miles E. of Peking.

Closely similar to the typical Korean series.

"Trapped beneath a thick bush among loose rocks in a cold damp canyon."—*M. P. A.*

#### 5. *CHODSIGOA HYPHIBIA* de Wint.

♂. 1558. ♀. 1559. Imperial Tombs, 65 miles E. of Peking. 1000'.

Since Mr. de Winton described his *Soriculus hypsibius*\* from N.W. Sze-chuen, correctly noticing the absence of the minute fourth unicuspid found in typical *Soriculus*, Dr. Kashtchenko† has made a new subgenus, *Chodsigoa*, for the species without that tooth. But while recognising the distinction of *Chodsigoa*, and even considering it rather genus than subgenus, I think that the typical species "*Soriculus (Chodsigoa) beresowski*" is undoubtedly identical with de Winton's animal, coming from practically the same locality, and having just about the same proportions. Nor can I at present see any reason to distinguish Mr. Anderson's specimens from *hypsibia*, in spite of their very different locality.

Mr. de Winton's type was previously the only specimen of this rare group of Shrews possessed by the British Museum.

"Trapped in a radish garden on a rocky hillside."—*M. P. A.*

#### 6. *VULPES VULPES* L.

♂. 1645, 1646, 1651. Tai-Yuen-Fu. 2700'.

These three skins illustrate the remarkable colour variation found among Foxes, one of them having a whitish, the second a slaty-grey, and the third a red under-side.

"Common."—*M. P. A.*

#### 7. *SCIUROTAMIAS DAVIDIANUS* M.-Edw.

♂. 1570. Imperial Tombs, 65 miles E. of Peking.

♀. 1643. 100 miles N.W. of Tai-Yuen-Fu, Shan-si. 8000'.

The genus *Sciurotamias* was formed by Mr. Gerrit Miller‡ for this remarkable Squirrel, which has a skull very like that of a Chipmunk, with the external appearance of a Squirrel. Prof. Milne-Edwards had previously noticed its near relationship to *Tamias*§.

"Not a common species, as only one was seen besides the

\* P. Z. S. 1899, p. 574.

† Ann. Mus. Zool. Acad. Sci. St. Pétersb. x. p. 252 (1906).

‡ P. Biol. Soc. Wash. xiv. p. 23 (1901).

§ Rech. Mamm. p. 160 *et seqq.* (1874).

present specimens. From the native reports I judge this animal to be a rock-loving species. Its colour is very like that of the local rocks.

"Evidently rare in Shan-si."—*M. P. A.*

8. *EUTAMIAS SENESCENS* Mill.

♂. 1561, 1562. Imperial Tombs, 65 miles E. of Peking.

The type of *E. senescens* was obtained about 15 miles to the west of Peking.

"Rare. I failed to see any alive, but got these two from hunters."—*M. P. A.*

9. *MERIONES PSAMMOPHILUS* M.-Edw.

♂. 1644. Tai-Yuen-Fu, Shan-si. 2800'

This species was discovered by Père David at Suen-hoa-fu, near Kalgan, but although Mr. Anderson, when in that region, obtained a good series of the other species, *M. unguiculatus*, he did not get *M. psammophilus*, which we are therefore very glad to obtain, as the only specimen in the Museum is without a skull.

"Inactive in winter, but doubtless conspicuous in warm weather."—*M. P. A.*

10. *MERIONES AUCEPS*, sp. n.

♂. 1647. East of Tai-Yuen-Fu, Shan-si. 4000'. 31 Dec., 1907. B.M. No. 8.8.7.30. *Type.*

A medium-sized species with the immensely large inflated bullæ of *M. erythrurus*.

Size about as in *M. unguiculatus*, the common species of Mongolia. General colour above of the usual buffy fawn, very much as in that species. Sides with a brighter buffy band edging the white. Belly practically pure white, the hairs mostly white to their roots, but some few with a little grey at their bases. Ears bright buffy, contrasting with the general tone. Hands and feet pure white; claws thin, whitish horn-colour, not blackish as in *M. unguiculatus*. Tail well-haired, but not specially tufted, rich ochraceous-buffy throughout, a few hairs at the extreme end tipped with black.

Skull much more heavily built than that of *M. unguiculatus*, with broad interorbital space and heavy muzzle. Bullæ exceedingly large, the part just in front of the external meatus so swollen as to touch the zygomatic, which they surpass in lateral spread.

Dimensions of the type, a rather young adult:—

Head and body 110 mm.; tail 105; hind foot 31; ear 15.5.

Skull—greatest length 36 mm.; basilar length 27.5; zygomatic breadth 19.5; tympanic breadth 20; interorbital breadth 6.2; palatilar length 15.5; diastema 9.2; palatal foramina 7; greatest

horizontal diameter of bullæ 14.5; length of upper tooth-row (alveoli) 5.3.

*Hab.* and *Type* as above.

Of the other Chinese *Meriones* described, this very pretty species may be distinguished from *M. unguiculatus* by its whitish claws, buffy ears, whiter belly, and less blackened tail; from *M. psammophilus* by its larger size and buffy ears; and from both by its enormously larger bullæ, which indicate that it is not really closely allied to either of them.

11. *MUS CONFUCIANUS*, M.-Edw.

♂. 1551. ♀. 1567, 1569. Imperial Tombs, 65 miles E. of Peking.

♂. 1600. ♀. 1599. Near Tai-Yuen-Fu, Shan-si. 5300'.

♂. 1648. East of Tai-Yuen-Fu. 4000'.

The Imperial Tombs specimens are very similar to the Kuatun examples considered as typical *confucianus* by Bonhote, and are equally distinct from the form found on the Chefoo Peninsula which I have named *M. c. sacer* in a previous paper.

"Not common; trapped among broken rocks and canyon-bottoms on hill-sides."—*M. P. A.*

12. *MUS WAGNERI MONGOLIUM* Thos.

♂. 1552, 1566. ♀. 1556, 1565, 1568. Imperial Tombs, 65 miles E. of Peking.

♂. 1611, 1617. ♀. 1603, 1621, 1629, 1635. 100 miles N.W. of Tai-Yuen-Fu, Shansi. 8000'.

Although these mice have no trace of an anterior supplementary cusp on their first upper molars, they are not improbably related to the Kan-su *Mus* "(*Leggada*)" *gansuensis* Satunin, a form evidently of the *musculus* group, and not a true *Leggada* at all.

"This small mouse seemed to be the commonest species in the vicinity of the Imperial Tombs, but still it was not met with very often. It lived under half-buried stones among the grass and bushes, or along the rocky banks of streams.

"In Shan-si it was somewhat common in the fields and about the peasants' threshing-grounds at Chao-Cheng-shan, but I did not see it elsewhere."—*M. P. A.*

13. *APODEMUS SPECIOSUS* Temm.

♂. 1560, 1563. ♀. 1555, 1564. Imperial Tombs, 65 miles E. of Peking.

♂. 1593. ♀. 1590, 1594. Near Tai-Yuen-Fu, Shan-si. 5300'.

♂. 1623, 1636. ♀. 1608, 1630, 1631. 100 miles N.W. of Tai-Yuen-Fu. 8000'.

The Shan-si specimens are not unlike the Korean subspecies *A. s. peninsulae*, to which perhaps the whole series should be

provisionally referred until further material is received bearing on their relationship to *A. s. chevrieri* and *draco*, of the S.W. and S. of China.

"As common as *A. agrarius*, but usually living among the bushes."—*M. P. A.*

14. *APODEMUS AGRARIUS COREÆ* Thos.

♂. 1550, 1554, 1557. Imperial Tombs, 65 miles E. of Peking.

As with most of the other Imperial Tombs animals the nearest relationship of this striped rat seems to be with the Korean subspecies, but in such a variable group the present series is not large enough for me to be very positive on the point.

"Moderately common; living in the tall grass which grows in certain open valleys."—*M. P. A.*

15. *CRICETULUS TRITON* de Wint.

♂. 1622 (immature). Chao-Cheng-Shan, 100 miles N.W. of Tai-Yuen-Fu, Shan-si. 8000'.

"Brought to me by a farmer, who had caught it in a straw-stack in his threshing-ground."—*M. P. A.*

16. *CRICETULUS ANDERSONI*, sp. n.

♂. 1591, 1592, 1596, 1601, 1602. ♀. 1595, 1597, 1598. Near Tai-Yuen-Fu, Shan-si. 5300'.

♂. 1626, 1641. ♀. 1604, 1605, 1619, 1620, 1627, 1628, 1642. 100 miles N.W. of Tai-Yuen-Fu. 8000'.

♂. 1649. ♀. 1650. East of Tai-Yuen-Fu. 4000'.

A small long-tailed species like *C. longicaudatus* M.-Edw., but with the belly-hairs grey basally.

General colour above drab-grey, the centre of the back indistinctly darker, but without a definite dark line. Sides often with a vaguely marked buffy area just in front of the hips. Under surface dull whitish grey, not sharply defined laterally, the hairs dark slaty for about two-thirds of their length. Ears blackish, with sharply contrasted white tip and edges. Hands and feet white; palms naked; soles hairy except in the region of the pads and on the under sides of the toes. Tail comparatively long, coloured above like the back, white below, and sometimes white all round at the tip.

Skull not strikingly different from that of *C. griseus*.

Dimensions of four specimens, measured in flesh:—

♂.	Head and body	80 mm.	; tail	38	; hind foot	15	; ear	15.
♂ (type)	"	83	" ; "	38	"	16	" ; "	15.5.
♀.	"	84	" ; "	44	"	17	" ; "	15.
♀.	"	85	" ; "	35	"	15.5	" ; "	13.

Skull of type—greatest length 25.5 mm.; basilar length 20.3; zygomatic breadth 13.3; nasals 9.2; interorbital breadth 3.7; breadth of brain-case 11.7; interparietal 2.6 × 9.2; palatilar

length 10.4; palatal foramina 5.3; length of upper molar series 3.9.

*Hab.* Shan-si—type from 100 miles N.W. of Tai-Yuen-Fu. 8000'.

*Type.* Adult male. B.M. No. 8.8.7.71. Original number 1626. Collected 3 December, 1907.

This Hamster is readily distinguishable from *C. longicaudatus* M.-Edw. by its grey-mixed belly, from *C. griseus* M.-Edw. and *C. dichrootis* Sat.\* by its longer tail, and from "*Urocrinetus*" *kamensis* Sat.\* by its shorter tail and smaller size. I confess I fail to see any sufficient reason why the long-tailed forms of this group should be separated in a special subgenus, even apart from the evidence given by *C. andersoni*, the tail of which is of a more or less intermediate length.

In laying such emphasis on the colour of the ears in *C. dichrootis*, Dr. Satunin does not seem to be aware that particoloured ears are a characteristic of most of the Far Eastern species, *C. griseus* and *C. obscurus* both having similar black and white ears.

I have named this pretty species after its collector, Mr. Anderson, by whom its distinctness from *C. griseus* was noticed.

"The common species of Hamster in Shan-si. It inhabits the neighbourhood of cultivated fields, making many horizontal burrows just beneath the surface of the earth."—*M. P. A.*

#### 17. *CRASEOMYS REGULUS* THOS.

♀. 1549. Imperial Tombs, 60 miles E. of Peking.

I cannot perceive any character by which this Vole can be distinguished from *C. regulus*, which was described from Korea.

"Trapped among bushes at the foot of a talus-slide; the only specimen seen, though I made great efforts to find more."—*M. P. A.*

#### 18. *CRASEOMYS SHANSEIUS*, sp. n.

♂. 1610, 1618, 1625, 1632, 1633, 1634, 1637, 1638, 1640.  
♀. 1607, 1609, 1616, 1624, 1639. 100 miles N.W. of Tai-Yuen-Fu, Shan-si. 8000'.

"Taken in spruce forest."

A large pale-coloured species with comparatively short tail.

Fur long, soft and loose; hairs of back (in winter coat) 12-13 mm. in length. Upper surface pale greyish *Evotomys*-colour, the reddish more suffused with grey than usual, though possibly this is not so much the case in specimens in summer pelage. Face and sides markedly greyer, without rufous suffusion. Under surface pale cream-buffy, the broad slaty bases to the hairs showing through. Hands and feet white above. Tail heavily haired, brown above, whitish or cream-coloured on sides and below.

\* Ann. Mus. Zool. St. Pétersb. vii. pp. 567 & 574 (1902).

Skull rather smaller than that of *C. regulus*; on the whole similar in shape except that the mesopterygoid fossa is unusually narrow, and the ridges bounding it do not slope upwards (dorsad) so much as usual, as they pass above (dorsad to) the posterior edge of the palate; the vertical space formed between the ridges and the hinder end of the palate is therefore of much less vertical extent than in other members of the *Evotomys-Craseomys* group.

Teeth apparently as usual, the last upper molar with six, and the first lower with nine salient angles.

Dimensions of four of the largest specimens:—

♂ (very old).	Head and body	104 mm.	; tail	32;	hind foot	18;	ear	13.
♂ (type)	"	98	" ; "	33;	"	18;	"	13.
♀.	"	100	" ; "	31;	"	18;	"	12.
♀.	"	93	" ; "	29;	"	17;	"	12.

Skull of type—greatest length 26.2 mm.; basilar length 23.3; zygomatic breadth 14.6; nasals 7.4; palatilar length 12.6; palatal foramina 5.5; length of upper molar series (crowns) 6.2.

*Hab.* As above.

*Type.* Adult male. B.M. No. 8.8.7.85. Original number 1634. Collected 4 December, 1907.

This fine species, which was found by Mr. Anderson high up in the spruce-covered mountains N.W. of Tai-Yuen-Fu, may be readily distinguished from any of its allies by its unusually short tail, which barely surpasses that of average members of the Microtine series of Voles. In addition its pale colour and peculiar palate are characteristic.

No Red Voles have hitherto been found anywhere near Shan-si, the nearest being the Chih-li example of *C. regulus* referred to above. I continue to use the name *Craseomys* in a generic sense for the group of Red Voles which either do not form roots to their molars at all, or only do so in extreme old age. Hardly a specimen of the Far Eastern species has been found with its molar teeth no longer encapsuled, so that it is of interest to mention that in No. 1625 the capsules have almost disappeared, and the molars appear to be on the point of forming roots. In the Scandinavian *C. rufocanus* roots appear to be formed at rather an earlier period of life, so that that species, while technically genotype, is the least typical member of the genus.

"Rather common in the brush-covered valley-bottoms at Chao-Cheng-Shan. Not seen elsewhere."—*M. P. A.*

#### 19. LEPUS SWINHOEI Thos.

♀. 1572. Tung-chou, on the Peking plain.

♂. 1613. ♀. 1606. 100 miles N.W. of Tai-Yuen-Fu, Shan-si. 8000'.

"Said to be common round Peking, but if so is not easily seen."

"A common species at Chao-Cheng-shan, and near Tai-Yuen,

as indicated by the number of tracks, but difficult to secure as they do not flush till one is close upon them."—*M. P. A.*

20. *CAPREOLUS BEDFORDI* Thos. (Plate XXXII.)

Abstr. P. Z. S. 1908, p. 32 (June 16).

♂. 1612, 1614 (skulls only). ♀. 1615. 100 miles N.W. of Tai-Yuen-Fu, Shan-si. 8000'.

Size rather larger than in the European *C. capreolus*, therefore much smaller than in *C. pygargus*. Horns comparatively small, therefore not like those of *C. tianshanicus*.

General colour above of a winter specimen buffy clay-colour, rather paler than the tone often rather loosely called "red" by sporting writers, therefore very different from the greyish brown of *C. capreolus*. Under surface dull whitish. the hairs grey at base, then whitish, washed terminally with pale fulvous. Head rather more rufous. Area behind nostrils blackish, but, at least in the winter coat, without the marked black band characteristic of *C. capreolus*. Lips, both upper and lower, and chin dull white, without blackish marks laterally. Hairs of throat "drab-grey," with whitish tips. Ears grizzled buffy and blackish, with darker edges, their internal surfaces whitish. Limbs dull buffy or pale tawny, more fulvous proximally, paler distally.

Skull larger than that of *C. capreolus*, markedly smaller than in *C. pygargus*. Horns comparatively slender, with the usual three tines.

Dimensions of the type, measured in flesh:—

Head and body 1125 mm.; hind foot 310; ear 130.

Skull of type—condylo-basal length 186 mm.\*

Skull of old male—condylo-basal length 207 mm.; greatest breadth 95; length of nasals 70; interorbital breadth 57; palatal length 126; length of upper tooth-series 66.

The condylo-basal lengths of two adult males of *C. pygargus* are 221 and 225 mm., while in a pair of *C. capreolus* this measurement is 184 (♂) and 181 (♀).

*Type.* Old female. B.M. No. 8.8.7.99. Original number 1615. Collected 25 November, 1907.

Although the original description is of a character to make identification difficult, I have little doubt that this is the Roe described by Noack † as *C.[ervus]‡ pygargus* var. *mantschuricus*, but this name, being preoccupied in the genus *Cervus*, was invalid *ab initio*, and cannot be reinstated (as was done by Lydekker §), whatever genus the animal is afterwards proved to belong to.

Under these circumstances I have particular pleasure in naming it after the Society's President, the Duke of Bedford, K.G., in

\* Slightly distorted, probably below the normal size.

† 'Humboldt,' viii. p. 9, 1889.

‡ That the *C.* stands for *Cervus* and not *Capreolus* is clear from the fact that in this paper the whole of the Cervidæ are included in one genus, the subordinate genera being barely accorded the rank of "groups."

§ 'Deer of all Lands,' p. 231, 1898.

recognition both of his carrying out of the present exploration, by which our knowledge of the Mammals of the Far East is being steadily revolutionized, and of the fact that his own personal acquaintance with the *Cervidae* and his wonderful collection of living Deer at Woburn have been the basis of much of the considerable increase in our knowledge of the group which has taken place of recent years.

"A common deer about the edges of the forest at Chao-Cheng-Shan. They were to be seen at all times of the day in groups of two to five. Rarely were they solitary. During one long tramp I saw fourteen in the day."—*M. P. A.*

2. On a Case of Imperfect Development in *Echinus esculentus*. By JAMES RITCHIE, M.A., B.Sc., The Royal Scottish Museum, and D. C. MCINTOSH, M.A., B.Sc., F.R.S.E.\*

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(Plate XXXIII.† and Text-figures 138–142.)

The description of abnormalities is of special value when these are of unusual character and occur in a species little liable to deviation from the type. Moreover, there has not hitherto been recorded any case of the special degree of abnormality illustrated by our specimen. Therefore it is that we venture to set down these observations, in spite of the fact that it seems impossible to account with certainty for the origin, or even to determine precisely the status, of the abnormality (whether it should be regarded as an example of congenital variation, or simply as a case of arrested development due to functional disturbance of the organism by some external factor).

The specimen, an example of the most common British Sea-Urchin (*Echinus esculentus* Linn.), for which we are indebted to Dr. A. Bowman, of the scientific staff of the Scottish North Sea Fishery Investigations, was obtained by him, in July 1907, in Basta Voe, Shetland, where it was trawled from a depth of twenty-four metres. In a note regarding it Dr. Bowman says:—"The malformed Urchin occurred amongst a number of typical ones. Unfortunately I took no notice at the time of any peculiarity in the living animal. . . . The sport was not noticed until the spines etc. were nearly all cleared off. I thought at first it was an unusually flat variety."

#### DESCRIPTION OF SPECIMEN.

##### (a) *General Description—Shape, Symmetry, &c.*

At first sight the specimen appears to be, as Dr. Bowman had noted, merely a rather flat variety, with a large oral surface and

\* Communicated by F. A. BATHER, D.Sc., F.Z.S.

† For explanation of the Plate, see p. 661.



Thomas, Oldfield. 1908. "The Duke of Bedford's Zoological Exploration in Eastern Asia.-X. List of Mammals from the Provinces of Chih-li and Shan-si, N. China." *Proceedings of the Zoological Society of London* 1908, 635–646.

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