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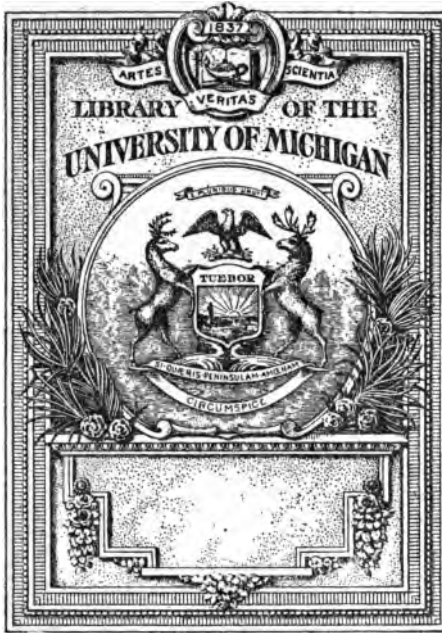
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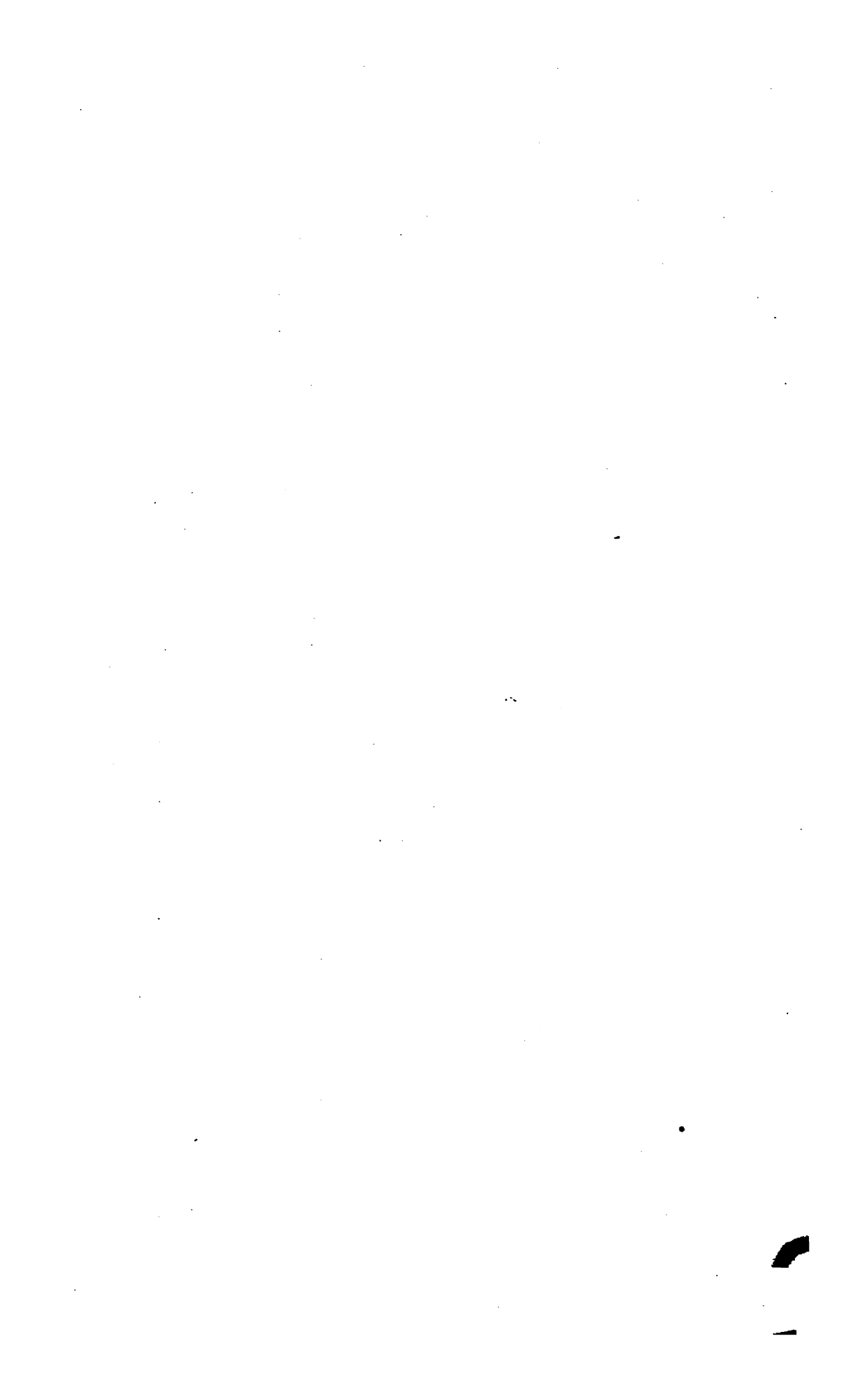
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THE WILD CAT.
(*Felis concolor*, Linn.)

THE
WILD CAT OF EUROPE.



(FELIS CATUS.)

BY

EDWARD HAMILTON, M.D., F.L.S., F.Z.S.

ILLUSTRATED BY P. & P. J. SMIT.

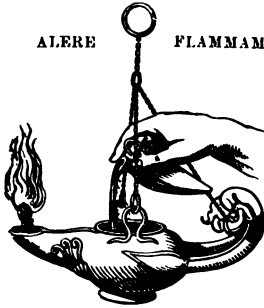
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PREFACE.

SOME few years ago, when reading a review of Knox's 'Autumns on the Spey,' I came upon the following passage:—"There is no British mammal, or reputed British mammal, of whose character, locality, and even existence we are so totally ignorant as the *Wild Cat*." This surprised me, particularly as it was from the pen of a well-known writer on natural history; so, with the view of giving a somewhat more connected history of this animal than is usually found in books on natural history, more especially as it was the only example of the Feline family indigenous to Britain, and on the point of becoming extinct, I commenced collecting together all available information relating to this subject, both on the Continent and in this country.

I did not expect to find any difficulty in being able to define the Wild Cat (*Felis catus*) as a distinct species. The task, however, was not so easy as I anticipated, for I found that the characteristics relied on by most authors as *specific* were not persistent, were at times absent, and were also often present in the Domestic

a 2

Cat. Moreover, on a careful examination of a number of examples of the Wild Cat of the present time I found many indications of a mixture of the two races.

It would seem as if the original Wild Cat, as it existed in the olden days, has been almost exterminated throughout Europe, and that its place has been taken by a mongrel race, the result of continual interbreeding during many centuries (2000 years) of the Wild and the imported Domestic Cat, whose original ancestor was probably the Caffer Cat (*Felis caffra*).

I am greatly indebted to the Authorities of the Natural History Department of the British Museum, especially to Mr. Oldfield Thomas, also to Professor Stewart of the College of Surgeons, to Dr. Benham and Mr. Goodrich of the Oxford University Museum, to Professor Alfred Newton and Mr. Bateson of the University Museum, Cambridge, to the Rev. Albert Watson, Mr. Heneage Cocks, Mr. Howard Saunders, Dr. J. Anderson, Mr. F. E. Beddard, Lord Lilford, Professor Mivart, and to many other friends for the assistance so freely and generously accorded to me during my investigations.

I am also under very great obligations to Dr. Alfred Nehring, of the Natural History Department of the College of Agriculture, Berlin, for the measurements of a number of the skulls of *Felis catus ferus* in that Museum.

To M. Julien Fraipont, Professor of Palæontology

in the University of Liége, I am also greatly indebted, for the measurements and figures of the prehistoric skulls found in the caverns of Engis and Ingihoul, in the province of Liége, Belgium.

And I have to return my best thanks to Mr. J. C. Mitchell, Professor of Zoology at the College of Agriculture at Gizeh, near Cairo, for the great trouble he has taken in procuring the measurements of the intestinal canals of *Felis chaus* (*F. caffra*?) and of the Egyptian Domestic Cat.

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INTRODUCTION.

THE Wild Cat (*Felis catus*, Linn.) is a member of the smaller race of the Feline family which, with the exception of the West Indies and the Australian region*, is generally distributed throughout the World.

Messrs. Flower and Lydekker, in their 'Introduction to the Study of Animals,' remark that "notwithstanding the considerable diversity in external appearance and size between different members of this extensive genus, the structural differences are but slight and so variously combined in different species that the numerous attempts hitherto made to subdivide it are all unsatisfactory and artificial." Among the principal differences they mention the form of the cranium, the length of the tail, the shape of the pupil of the eye, and the condition and coloration of the fur.

In the smaller race of Cats the pupils of the eyes are, as a rule, of an oval form and contract when exposed to a bright light, or when excited by anger, to an oat-shaped oval or to a vertical linear slit.

* Wild Cats, the offspring of Domestic Cats which have taken to a feral life, are now, we believe, prevalent in New Zealand and probably also on the Australian continent.

Elliot, in his 'Monograph of the Felidæ,' states that all the smaller examples of the Cats, with the exception of the Ocelot (*Felis pardalis*), have oval pupils; but Dr. W. T. Blanford, in his 'Fauna of British India,' states that the Fishing Cat (*Felis viverrina*) and the Bengal Cat (*Felis bengalensis*) have circular pupils, the latter perhaps elliptical in a strong light.

Dr. G. Lindsay Johnson, 'Proceedings of the Zoological Society,' May 1894, states that the pupil of the Wild Cat is circular and contracts to an oval. This is contrary to our experience. We have examined a number of living examples from different parts of Europe, as well as from Scotland, and have without exception found that on exposure to a bright light the pupils have contracted to a *vertical linear slit*.

If we can judge from the knowledge we have of the Wild Cats of different countries interbreeding with domesticated Cats, we may almost with certainty conclude that the smaller varieties interbreed freely with each other and produce fertile offspring, and that some of the Asiatic species—*F. bengalensis* with its fourteen synonyms, for example—may be the result of this promiscuous intercourse. Blanford states that many of the village Domestic Cats are similarly spotted to *Felis ornata* in localities where this Cat is found; and that many examples of the present form of *F. torquata* are probably descendants of tame Cats run wild, the aboriginal race being the source of the Indian Domestic Cats.

In the smaller races the kittens are born with closed eyelids, and the parents for the most part discard their young when they cease to be nourished by the mother.

In the larger Felidæ some appear to be monogamous and to pair for life. The Lion remains with the Lioness whilst the cubs are young and helpless and assists in providing them with food after they have ceased to be nourished by the mother, the cubs remaining with their parents until they are nearly full-grown.

It is the same with the Tiger. Sir Joseph Fayer states that the cubs remain with the parents until they are nearly full-grown, and others have verified the truth of his observation. The late General Douglas Hamilton ('Sport in Southern India') records having seen a family, consisting of the two parents and three nearly full-grown cubs, migrating from one locality to another.

According to the observations of Mr. Hunt, the Superintendent of the Zoological Gardens at Dublin, the cubs of the larger race are not always born with closed eyelids. He writes:—"In some cases we find cubs born with their eyes open and in others not so. In 1894 we had two Lionesses which had cubs—in one the cubs had their eyes open at birth and in the other they were blind for three days after birth;" and adds this remark: "We hardly ever find them blind after three days."

In the larger Felidæ the pupils of the eyes are round and never contract to a vertical slit.

Dr. G. Lindsay Johnson, *l. c.*, states that “In the Lion, Tiger, Puma, and Leopard, in fact in all the large Felidæ, the pupil is invariably round, and as a rule retains its circular shape when contracting, thus forming a decided contrast to the smaller Felidæ.”

The different species of the larger race never interbreed with each other. There is no record of any hybrid having ever been found in a wild state, which certainly would have been the case with our present knowledge had such existed.

A few instances have been recorded of a Lion and a Tigress interbreeding in captivity; and Sir W. Jardine gives the figure of a hybrid between these two animals in vol. ii. of ‘The Naturalist’s Library’; and another instance is recorded from the same menagerie (Mr. Aitken’s) of hybrids between an Asiatic Lion bred in this country and a Tigress, being born at Windsor. The cubs all died before arriving at maturity*.

The chief food of the Wild Cat is the flesh of the smaller Mammalia and birds—Hares, Rabbits, the different species of Voles, Squirrels, Rats, Moles, &c., the Game-birds, Pigeons, and the smaller birds.

Mr. Heneage Cocks writes that the Wild Cats he kept in confinement for a number of years were

* In Allen’s ‘Naturalist’s Library,’ 1895, which appears to be a reprint with additions of Sir W. Jardine’s ‘Naturalist’s Library,’ it is stated that six litters of hybrids were produced in Mr. Aitken’s menagerie between 1824 and 1833. One male, it is stated, lived for ten years in the Liverpool Zoological Gardens.

particularly fond of the Water-Vole ; they would also eat Guinea-pigs and Weasels, and one of them was suspected of killing and eating a Polecat.

Domestic Cats are known to be particularly partial to fish, and there is one Asiatic variety, the Fishing Cat (*Felis viverrina*), which lives almost entirely on fish and shellfish, as *Ampullariæ* and *Unios*. It is also stated that this Cat has a very disagreeable smell and is extremely fierce.

THE WILD CAT OF EUROPE.

(FELIS CATUS.)

Order **CARNIVORA.**

Suborder **FISSIPEDIA.**

Section **ÆLUROIDEA.**

Family **FELIDÆ.**

Genus **FELIS.**

Species **FELIS SYLVESTRIS, Gesner.**

FELIS CATUS, Linnæus.

Synonyms.

- FELIS SYLVESTRIS, Gesner, Konrad von, Hist. Anim. 1551;**
Aldrovandus, Ulisses, De Quadrupedibus digitatis ovip.
1637; *Olaus Magnus, Hist. Brev. de Felibus seu Catus;*
Buffon, G. L. Comte de, Hist. Nat. 1755; Brisson, M.,
Le Règne Animal, 1756; Jonstonus, Johannes, Hist.
Nat. de Quadrup. 1759; Schreber, J. C. D. von, Die
Säugethiere, 1775, vol. iii.
- FELIS SYLVATICA, Merrett, Christophe, Pinax Rerum natura-**
lium Brit. 1667.
- FELIS AGRESTE, Scaliger, Jul. Cæsar, Comment. Aristotelis**
Hist. de Animalibus, 1619.
- FELIS DOMESTICA seu CATUS, Ray, John, Synop. Method.**
Anim. Quad. 1693.
- CATUS SYLVESTRIS, Sibbald, Sir R., Prodrum Hist. Nat. in**
Scot. illust. 1684.

- CATUS SYLVESTRIS FERUS vel FERALIS, *Klein, J. T.*, Quadruped. dispos. brevisque Hist. Nat. 1751.
- CATUS SYLVESTRIS vel FELIS SYLVESTRIS FERUS, *Pennant, Thos.*, Hist. of Quad. 1781.
- FELIS CATUS, *Linnæus, Carl von*, Fauna Suec. 1746; *Bewick, Thos.*, A General Hist. of Quadrupeds, 1807; *Stark, John*, Elem. of Nat. Hist. 1823; *Temminck*, Monographie de Mammalogie, 1827; *Jardine, Sir W.*, Naturalist's Library, Mammalia, 1834; *Jenyns, Rev. L.*, Manual of British Vertebrate Animals, 1835; *Cuvier, G. L., Baron*, Règne Animal, Carn. Digit. 1836; *Bell, Thos.*, A Hist. of British Quadrupeds, 1837, 1874; *Macgillivray, W.*, Nat. Libr., British Quadrupeds, 1838; *Donovan, E.*, Nat. Hist. Brit. Quad. 1845; *Blasius, H.*, Naturgesch. der Säugethiere Deutschlands, 1857; *Brehm, A. E.*, Thierleben, Leipsic, 1876-79.
- FELIS CATUS FERUS, *Linnæus, Carl von*, System. Natur., Ed. xiii. by *J. F. Gmelin*, 1788.
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- FELIS CATUS FERUS, *Bingley, Rev. W.*, Brit. Quadrupeds, 1809.

Vernacular Names.

- ENGLISH : *Wild Cat, Wood-Cat, British Tiger.*
- GÆLIC : *Cat fiad-haich.*
- WELSH : *Cath-goed.*
- FRENCH : *Chat sauvage, Chat des Bois, Chat haret.*
- GERMAN : *Wilde Katze, Graue Katze, Wildkatze, Baumritter.*
- DUTCH : *Wilde Kat.*
- BELGIAN : *Chat sauvage ; Wel Katz, Tchet sawatche* (Wallon).
- SPANISH : *Gato montés, Gato romano.*
- ITALIAN : *Gatto silvatico.*
- RUSSIAN : *Stepnaja Koschka.*
- GREEK : *κάττος.*
- POLISH : *Kot dziki.*

ETYMOLOGY OF THE WORD "CAT."

ACCORDING to MURRAY'S 'New English Dictionary,' the word *Cat* is of unknown origin, but exists in various languages as far back as their records go. It is found in old western Germanic as early as 400-450 A.D. In old high German it is *Chazza*, *Chatero*; in middle German *Kattaro*.

MURRAY says that no form of the word is preserved in Gothic; it is not, therefore, certain that it can be traced back to the old Teutonic period.

CHAMPFLEURY considers it of Celto-Germanic origin.

In Gaelic it is *Cat*, *Cat fiad-haich* (Wild Cat). In Welsh and Cornish *Cath*. In old French *Cat*, *Chater*.

In Latin the word is not found earlier than the first century of our era, if Martial's epigram (*Cattæ*, lib. xiii. 69),

"Pannonicas nobis nunquam dedit Umbria cattas :
Mavult hæc domino mittere dona Pudens,"

applies to this animal.

PALLADIUS, who wrote his work on Agriculture circa 350 A.D., mentions an animal called *Catus* or *Cattus* as useful in granaries for the destruction of mice. This must surely apply to the domestic race, and it is probable that the word *Cat* as used in the old languages refers to the Domestic Cat.

The term *κάττος*, *κάττα*, in Byzantine Greek was employed to designate the domesticated Cat brought from Egypt.

GEOGRAPHICAL DISTRIBUTION.

THE European Wild Cat had an extensive geographical range, including Great Britain, France, the Netherlands, Switzerland, Germany, Bohemia, Hungary, Poland, Transylvania, Galicia, the Caucasus as far as the Caspian, Southern Russia, Italy, Spain, Greece, Roumelia, Bulgaria, Servia, Turkey in Europe, and some parts of Northern Asia.

Its favourite haunts were forests, with masses of rocks or cliffs interspersed with trees. In the crevices of these rocks or the hollow boles of the trees it made its lair.

ABEL CHAPMAN ('Wild Spain') found them on the shores of what he calls the Bætican Wilderness, amongst the giant heather, bamboos, and wild gorse, where their prey, in the shape of bird-life, was abundant; in the scrub-clad plains bounding the Marisma—the haunt of the Flamingoes—amongst the rabbits which frequented the open spaces; in the immense cork-woods, amidst the tree-heaths and arbutus which border the stagnant pools on the Cistus plains; and amongst the cane-brakes and bamboos in Doñana.

They breed, he says, in the sierras in crags and rabbit-burrows, and in plains the young are often produced in nests built in trees or among the tall bamboos in the cane-brakes.

Chapman states that the young Wild Cats are quite the most ferocious and utterly untamable beasts of which he had any experience. "The mixture of fear and fury they exhibit in captivity is indescribable."

At the present time the Wild Cat has become almost extinct in many of the above districts. Examples may perhaps occasionally still be found in the uninhabited forests and mountains of Hungary and Transylvania, and occasionally in Spain and Greece, as well as in the Caucasus and in some of the Swiss Cantons, but the original race has in most countries interbred with the Domestic Cat wherever the latter has penetrated.

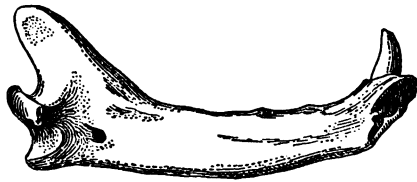
ANCESTRAL DESCENT.

THE Wild Cat of Europe, the *Felis sylvestris* of the earlier naturalists, the *Felis catus* of Linnæus, the only indigenous representative of the feline family in Britain, derives its ancestral descent in all probability directly from one or both of the species of Cat whose osseous remains have been found in the Pleistocene deposits both in this country and on the Continent, intermingled with the bones of the great Cave-Lion (*Felis spelæa*), the great Cave-Bear (*Ursus spelæus*), the Rhinoceros (*R. tichorhinus*), the Mammoth, and other gigantic mammals of that period of the Earth's crust.

These osseous remains consist of:—

- I. A portion of the lower jaw (left mandible) found in the brick-earth of Grays Thurrock (fig. 1), which, according to OWEN ('British Fossil Mammals and Birds'), is undistinguishable from the analogous parts of the still existing species of Wild Cat.

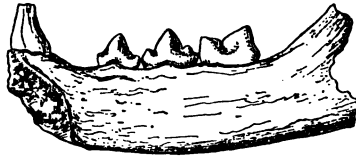
Fig. 1. Nat. size.



- II. A portion of the right mandible of the lower jaw found in Kent's Hole, Torquay (fig. 2), which is stated by the same authority to accord precisely in colour and composition

with the fossils of the extinct quadrupeds found in the same cave.

Fig. 2. Nat. size.



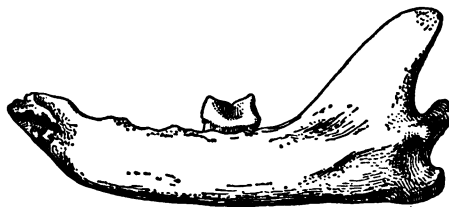
III. Portion of the ramus of a lower jaw from Bleadon Cave, Mendip Hills, Somersetshire. See fig. 3.

Fig. 3. Nat. size.



IV. Right half of the lower jaw from the Gower Caves, St. Asaph (fig. 4), together with a right humerus and a portion of the tibia (figs. 5 and 6).

Fig. 4. Nat. size.



V. A large number of bones, including portions of skulls, from the Pleistocene deposits in the caverns near Liége, Belgium, and in the same deposits at Lunel-Viel, France, which have

been described by Dr. SCHMERLING ('Oss. Foss. de Liége,' vol. ii.) and by MM. MARCEL DE SERRES, DUBREUIL, and JEAN-JEAN ('Recherches

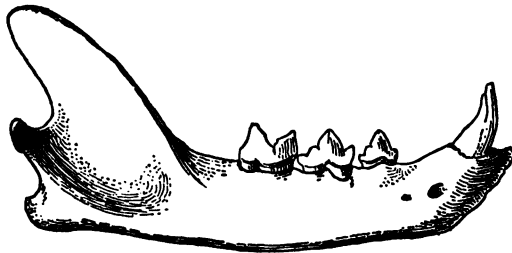
Fig. 5. Nat. size.



Fig. 6. Nat. size.



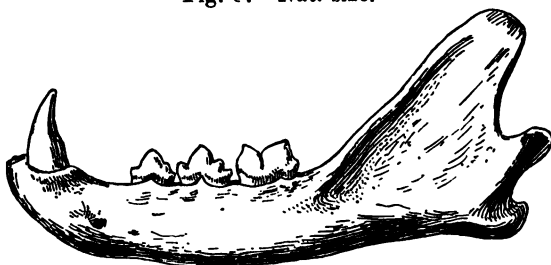
Fig. 7. Nat. size.



sur les Ossemens fossiles des Cavernes de Lunel-Viel,' 1839, p. 110), and are now in the Museum of the University of Liége.

Figs. 7 and 8 are the right and left half of the lower jaw of a Mummy Cat (*F. maniculata*) and a Wild Cat (*F. catus*, present time), which are given for comparison.

Fig. 8. Nat. size.



VI. Skulls (8) found in the caverns of Engis and Ingihoul, province of Liége, in the possession of M. JULIEN FRAIPONT, Professor of Palæontology in the University of Liége. See figs. 9 and 10 (pp. 12, 13), two of the above.

Dr. SCHMERLING, from the larger size of some of the bones, concluded that there were two species, and divided them into (1) *Felis catus magna*, (2) *Felis catus minuta*; but Owen considered that this difference in size did not vary from the standard of the existing Wild Cat more than would be due to age and sex.

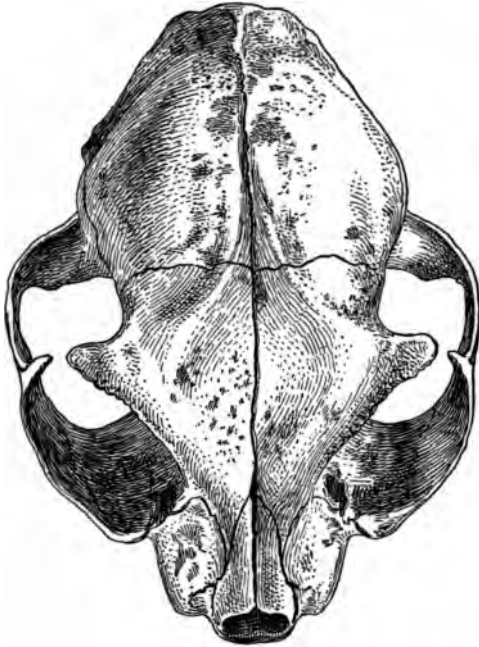
Professor BOYD DAWKINS and Mr. AYSHFORD SANFORD ("Brit. Pleist. Mamm.," Palæontogr. Society's Trans., 1872-73), however, contend that the larger bones found in the Liége caverns and those from the Bleadon Cave belong to a larger animal than *Felis catus*, and they come to the conclusion that a species of Wild Cat, very closely allied to *Felis caffer*, lived in Northern Belgium and France in the Pleistocene

Period ; and although they will not say, owing to the very fragmentary evidence, that *F. caffer* also inhabited Britain, yet from the similarity of the jaw found in Bleadon Cave to that of *F. caffer*, it almost amounts to a certainty. Indeed they say : "There is nothing unreasonable in the suggestion of a Cat now found only in Africa having once ranged over Europe, since the Spotted Hyæna, the Hippopotamus, and the Panther were members of the Pleistocene fauna, as well as being now associated with *Felis caffer* in Africa."

If this supposition be correct, it would seem that the smaller species was enabled to survive throughout Europe during all the geological changes, owing to its natural food, in the shape of the leporine and other rodent forms, continuing to exist, as, according to Owen, there is no difference between the fossil bones of the Pleistocene species of *Lepus* and *Arvicola* and those of the present time ; while the larger species, from some cause as yet unexplained, became extinct.

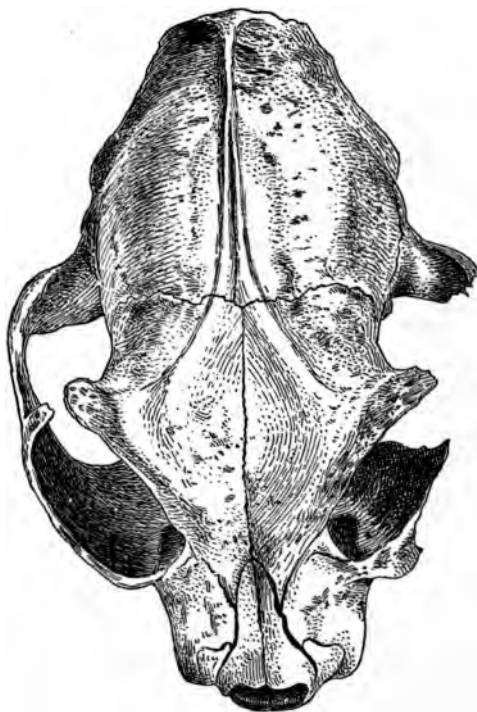
From the measurements of the bones and skulls, it would appear that one of the Wild Cats of the Pleistocene age was a smaller animal than *Felis sylvestris* of Gesner or *Felis catus* of Linnæus. M. JULIEN FRAIPONT has forwarded to me the measurements of eight skulls which have been found in the deposits of the caverns of Engis and Ingihoul, near Liège, Belgium, intermingled with the bones of the Mammoth, Rhinoceros, &c. ; these measurements range from 69 to 77 mm. in basal length, and from 39 to 43 mm. in breadth over the cranium ; while the skulls of *Felis catus* (the Wild Cat of historic times) range from 78 to 89 mm. in basal length, and from 44 to 52 mm. in cranial breadth

Fig. 9.



Skull found in Engis Cavern, near Liège. Nat. size.

Fig. 10.



Skull found in Engis Cavern, near Liége. Nat. size.

(see figs. 13, 14, 15). The humerus of a supposed Wild Cat found in Gower Cave, St. Asaph, measures 84 mm. in length, while that of the Wild Cat of later days measures 109 mm. (compare figs. 5 & 6, p. 8, with figs. 20 & 28, pp. 63 & 67).

Osseous remains of Wild Cats of a much later period than those mentioned above have been found in the peat-deposits and elsewhere mixed with the bones of extinct forms of Deer, Ox, and other animals.

M. LARTET ("On Human Remains," Ann. des Sci. Nat.) (Natural History Review, 1862) states that the osseous remains of a Cat supposed to be *Felis catus* have been found in the human sepulchral cave at Aurignac mixed with the bones of *Felis spelæa*, *Elephas primigenius*, *Rhinoceros tichorhinus*, &c. This sepulchral vault is considered by Lartet to be of the highest antiquity, as indicated by the existence of almost entire bones of the great Cave-Bear, which appear to have been introduced into the cave by the hand of Man. "Palæontographically," he says, "the human race of Aurignac belongs to the remotest antiquity to which, up to the present time, the existence of Man or the vestiges of his industry can be traced. This race was evidently contemporary with the Aurochs, Reindeer, Gigantic Elk, Rhinoceros, Hyæna, &c., and, what is more, with the great Cave-Bear (*Ursus spelæus*), which would appear to have been the earliest to disappear in the group of great mammals generally regarded as characteristic of the last geological period."

RECORDS OF THE WILD CAT IN ENGLAND
AND WALES.

A NUMBER of old deeds and charters still extant, and mentioned by Mr. J. E. HARTING in his 'Notes on the Hunting of the Wild Cat,' sufficiently prove that a Wild Cat inhabited the greater part of England up to the end of the fifteenth century. In 1205, the sixth year of the reign of King John, that monarch granted a licence to one Gerard Camville, to hunt the Hare, the Fox, and the Wild Cat in all the King's forests; and the Wild Cats must have been very numerous in those days, as some seventy years earlier than the above date, viz. in 1127, the skins of Cats (presumably Wild Cats, as at that time the Domestic Cat was rare and valuable) were used for the lining of dresses. Archbishop CORBOYLE, in his Canons, ordered that no abbess or nun should use any more costly fur than is made of Lamb- or Cat-skins; and STRUTT ('Habits of the Anglo-Normans') states that there is a decree extant of Edward the Third, which ordained that no tradesman or yeoman, or their wives and children, should wear any kind of fur, except that of Lambs, Rabbits, Foxes, or Cats.

During the reigns of John, Richard II., Edward II. and III., licences were granted, and lands held under the Crown, for hunting various chases and for the destruction of Wolves, Foxes, Martens, Wild Cats, and other vermin, in the counties of Buckingham, Devonshire, Essex, Huntingdon, Lincolnshire, Northamptonshire, Oxford, Rutland, &c.

In the 'Booke of St. Albans,' printed by WYNKYN DE WODE in 1496, the Wild Cat is mentioned among the "Bestys of chase sweete and stynking"; and

three years previously he printed a translation by THOMAS BULLER of 'Bartholomæus de Proprietatibus Rerum,' in which the Wild Cat is likened to a Leopard with a great mouth, sharp teeth, a cruel heart, dwelleth in woods, and lives on small wild beasts, as Conies and Hares.

The increased cultivation of the land, with the gradual thinning of the forests and woodlands, drove the Wild Cat from its more southern haunts; but it must have been still plentiful in the midland and northern counties during the 16th, 17th, and part of the 18th centuries. SHAKESPEARE, a keen observer of all things in nature, writing in 1593, refers, in his play of "The Merchant of Venice," to the habits of the Wild Cat:—

"The patch is kind enough; but a huge feeder.
Snail-slow in profit, and he sleeps by day
More than the wild cat."

And, again, in "The Taming of The Shrew," written in 1606, he makes Petruchio say to Katharine:

"Thou must be married to no man but me:
For I am he, am born to tame you, Kate;
And bring you from a wild cat to a Kate
Conformable, as other household Kates."

Also in Macbeth, Act iv.:

"Thrice the brinded cat hath mew'd."

A Dr. WILLIAM SALMON, who wrote a curious book called the 'Compleat English Physician, or The Druggist's Shop opened,' in 1693, mentions the Wild Cat, of which he says "there are three kinds, the Tame Cat, the Wild Wood Cat, and the Cat of the Mountain, all of which are of one nature, and agree much in one shape except as to their magnitude.

The Wild Cat being much larger than the Tame, and the Cat of the Mountain larger than the Wild Cat.”

Some portions of the Wild Cat appear in his time to have been employed as medical aids:—“1st. The flesh of the Wild Cat is particularly helpful to the gout. 2. The fat is hot, dry, emollient, discussive, and anodyne; mixed with palm oil and oil of aniseed, dissolves tumours, eases pain, prevails against nodes on the skin and the cold gout. 3. The blood of the tail of a Bore Cat, 10 drops mixed with six grains of salt of manskull, with 10 grains of the powder of ox horns, will cure the falling sickness. 4. Certain excrements made into a powder, and mixed with mustard seed, juice of onions, and bear’s grease, enough to form an ointment, cures baldness and the Alopecia.”

In 1697, NICOLAS COX (‘The Gentleman’s Recreation, or a Treatise giving the best directions for hunting and killing all manner of chases used in England, &c.’), in his remarks upon the Marten and the Wild Cat, says:—“This (the Martern) and the Wild Cat are a sort of vermin, which are here in England commonly to hunt and as necessary to be hunted as any vermin can be. For the question may be doubtful, whether either Fox or Badger do more hurt than the Wild Cat doth, since there are so many warrens everywhere throughout the kingdom of England which are very much infested by the Wild Cat. It is the opinion of long experienced huntsmen that she leaveth as great a scent, and maketh as good a cry for the time as any vermin that is hunted, especially the Martern passeth all other vermin for sweetness of scent and her Case is a noble Furr. The Wild Cat’s Case is not so good, but it is very warm

and medicinal for several aches and pains in the bones and joints; also her grease is very good for sinews that are shrunk."

According to the Rev. J. MORTON ('History of the County of Northampton') the Wild Cat was still to be found in that county as late as 1712. He says:—"We now meet with them, though more rarely, since the woods have been thinned. They here are called 'Birdies,' and those which are found in Whittlewood Forest (Whittlewood lies between Towcester, Stoney Stratford, and Buckingham) are of very large size, and in their wailing noise and other properties they agree with our domestic Cats, but their skin seems to be tanned as it were with the sun and weather."

In the county of Cumberland, when DANIEL DEFOE made his tour through Great Britain, 1710, Wild Cats, according to his account, were abundant: he made an excursion in his journey through Cumberland to Christenbury Craig, and came upon some caves amongst the rocks where the moss-troopers formerly retreated for security, and where others had at times taken up their abode; but at present, he says, "it has no inhabitants but Wild Cats, of which there are many, the largest I ever saw." H. A. MACPHERSON, in the prefatory notice on the destruction of wild animals, in his 'Vertebrate Fauna of Lakeland,' gives a list of Wild Cats killed between 1706 and 1755 in the parishes of Martindale and Barton, which amounted to fifty. By 1790 the number had considerably diminished, for Dr. JOHN HEYSHAM, in Hutchinson's 'History of Cumberland,' 1794, states that "very few Wild Cats are now to be met with in any of our woods, except those bordering on the lakes, and even there they are far from numerous."

Reports of the early part of the 19th century show a great diminution in the number of Wild Cats, even in the most northern counties, and it is probable that in the midlands and in the south, east, and west it had become practically extinct.

The Rev. W. BINGLEY, in his 'Memoirs of British Quadrupeds,' 1809, states that a century ago Wild Cats were to be found in the woods of Northamptonshire, but now they are all destroyed.

H. SCOTT, 'British Field Sports,' 1818, writes:—"As to the Wild Cat, a chase of some name in ancient records, the breed seems now to be extinct in our country, not so much belike, as one being kept even in Cheshire, to teach people how to grin." And W. D. ROEBUCK, in the 'Vertebrate Fauna of Yorkshire,' states that the Hambleton Hills were the final refuge of this animal in Yorkshire, and that the last example was killed by Mr. John Harrison at his farm at Murton, near Hawaby, in the winter of 1840. He also says that the evidence of the former existence of the Wild Cat in South Yorkshire is confined to entries in the Churchwardens' accounts at Ecclesfield of sums paid in 1589 and 1626 for the destruction of Wylde Cats, and to a legend of doubtful origin of an encounter, fatal to both, between a Wild Cat and a man of the family of Cresacre at Burnborough.

In Northumberland the Wild Cat was supposed to have lingered as late as 1853, the last being killed by Lord Ravensworth at Eslington.

The different reports in the 'Zoologist' and elsewhere of a Wild Cat being killed near Godalming in 1849, in Devonshire in 1865, in Cumberland in 1871, in Hampshire, near Ringwood, in 1875, in

Hertfordshire in 1875, in Lincolnshire in 1881, and in the Isle of Wight in 1877, must be taken "cum grano." They were probably the offspring of Domestic Cats run wild. Wild they were no doubt, but not the genuine *Felis sylvestris*. The editor of the 'Zoologist,' remarking on one of these reports, says:—"We are extremely sceptical in regard to the alleged existence of Wild Cats in the south of England at the present day, and notwithstanding the colour and large size of many of the animals killed, we cannot help regarding them as of hearth-rug ancestry."

The Wild Cat of mediæval days, the *Felis sylvestris* of the old authors, has been quite extinct in England for nearly half a century, supposing even that the Cat killed by Lord Ravensworth was an example of the old race; but it is probable its extermination would date many years previous to 1853.

In Wales the Wild Cat must have been as prevalent as in England, or even more so, owing to the nature of the country. When it became extinct is difficult to ascertain.

Professor BOYD DAWKINS states that the Wild Cat still lingers in South Wales, near Tenby; and other writers say the same, without giving any authority. Professor MIVART considers that the Wild Cat has been extinct in Wales for certainly the last twenty years.

The last record of a Wild, or supposed Wild, Cat in Wales is from a Mr. W. JONES, who states that one was trapped in Montgomeryshire in 1864, which weighed 11 pounds.

RECORDS OF THE WILD CAT IN SCOTLAND.

THERE is no very early record of the Wild Cat north of the Tweed, where it continued to exist long after its extinction south of that river.

ROBERT LINDSAY ('The Chronicles of Scotland,' vol. ii. p. 346) gives an account of a great hunt at the Earl of Athol's in 1528, in which James V. took part, where a great number of large and small beasts were slain, amongst them Wild Cats; and Sir ROBERT SIBBALD (*Prodr. Hist. Nat. in Scotia illust.*, 1684) gives a description of the Wild Cat.

From the nature of the country and from the scattered and scanty population, the Wild Cat continued to hold its own over the greater part of Scotland until a very recent period. BINGLEY, writing in 1809, says that "in the united parishes of Loch Goil Head and Kilmorich in Argyleshire, Wild Cats are more numerous than Foxes, and will at times, especially when wounded, attack human beings."

Sir WALTER SCOTT, writing in 1824 ('Familiar Letters,' 1893), states that the gardener at Lochore in Fifeshire, one John Macleod, told him that he had destroyed, of vermin, two Wild Cats, eight household Cats gone wild, five Polecats, one of terrible size and weight, which Sir Walter thinks must have been a Marten Cat, five Weasels, three Whitretts, besides sundry Magpies.

SELBY ('Quadrupeds and Birds of the County of Sutherland,' 1835) states that the Wild or Mountain Cat is very plentiful in the mountain districts, where they attain a great size, and at times commit great ravages upon the young lambs in Assynt; upon the Ben More range they are very numerous,

and find secure shelter and protection in the numerous caverns and holes in the limestone districts.

MACGILLIVRAY (Nat. Libr. vol. ii. 1838) says that the Wild Cat appears to be more abundant in the woods of the counties of Perth, Aberdeen, and Argyle than in any other part of Scotland, and specimens from these districts are not unfrequently sent to Edinburgh to be preserved.

The same author, writing in 1855, reports that the Wild Cat had become extremely rare.

ROBERT GRAY, in a list of the Quadrupeds of Loch Lomond and its vicinity, in 1877, states that this undoubted species has been repeatedly trapped in the immediate vicinity of the Loch.

The late E. R. ALSTON ('The Fauna of Scotland,' 1880) says that this animal, once generally distributed over the mainland, is now totally extirpated in the lowlands and in many parts of the highlands. It is still to be found, however, in the wilder districts of most of the northern counties, especially in the Deer forests, where it is left comparatively undisturbed. Till of late years its southern outpost was the mountainous country about Loch Lomond; but it is now extinct in that neighbourhood, and Alston believed that none exist south of the northern district of Argyle and Perthshire. There appears to be no evidence that the Wild Cat was ever found in any of the Islands.

J. A. HARVIE-BROWN, in "The Past and Present Distribution of the Rarer Animals of Scotland" (Zool. 1881), gives a list of the different counties in which the Wild Cat has been killed or last seen in the present century. He states that in Dumfries, Kirkcudbrightshire, and Wigtonshire not one has been seen for

the last 50 years. The last traditional Wild Cat in the museum at Dumfries proved on close inspection to be an unusually finely stuffed example of the common Tabby. The last Wild Cat killed in Dumbartonshire was in 1857, in Stirlingshire in 1842. In Perthshire, where formerly it was abundant, a correspondent informs Harvie-Brown that an example of the Wild Cat has not been seen for the last twenty years, and adds that many so-called Wild Cats have been proved to be, on close examination, Domestic Cats which had taken to the woods.

In Forfarshire and Kincardineshire there is no record since 1850. In Aberdeenshire the last reported was in 1877, and in Banff, Elgin, and Nairn no record for the last fifty years. In some parts of Inverness-shire, HARVIE-BROWN states that it is still found about Arisaig and Moidart on the west coast, and in Lochaber and on Ben Alder further inland.

In Argyleshire a Wild Cat was killed in 1879, near Strontian House, Sunart, and one was taken alive at Ranachan, in Camusain Wood, on the north side of Loch Sunart. A correspondent stated to Harvie-Brown that in 1875 "the lady of a neighbouring proprietor applied to me for assistance in procuring from fifteen to twenty Wild Cat skins for a lining to a gentleman's 'dreadnought' or ulster. In a few weeks, by purchase or otherwise, the requisite number was obtained. Most were, no doubt, killed between 1872 and 1875, and were procured from the districts of Arisaig, Moidart, Ardnamurchan, Sunart, Ardgour, and Morvern."

This has since been proved to be quite incorrect. They were the skins of Crofters' cats, common house tabbies, all very fine and large, and it is more than

probable that most of the Wild Cats reported as genuine Wild Cats for the last fifty years have the same origin. Four very fine examples of the mixed breed have been taken within the last year, 1895-6, in Morvern, Argyleshire—the tails very thick, the rings and tip black.

The same author, writing in 1881, considers that the Wild Cat has become almost, if not entirely, extinct, all south and east of a line commencing, roughly speaking, at Oban, continuing north-west of the junction of the three counties of Perth, Forfar, and Aberdeen, thence across the corner of the Dee to Tomintoul, Banff, to the city of Inverness.

Further north Messrs. HARVIE-BROWN and T. E. BUCKLEY ('A Vertebrate Fauna of Sutherland, Caithness, and Cromarty') state that, although it has become extremely rare in Assynt, it is said to be found in the Forest of Reay; but in answer to an application we made for an example from that forest in November 1891, the Duke of Westminster wrote:—"The genuine Wild Cat is, as you know, a very rare animal indeed, and I do not know of any in the Reay country, but will write down and enquire, and if there is such a thing and it can be got you shall have it."

The Wild Cat is not found on any of the islands of the Outer and Inner Hebrides. The examples reported from Skye, Mull, Gigha, Canna, &c. are the offspring of the Crofters' cats run wild, a very common occurrence in all parts of the Highlands and elsewhere.

Messrs. HARVIE-BROWN and T. E. BUCKLEY ('A Fauna of the Outer Hebrides'), under the heading of Wild Cat, give the following observations, proving how

much care is necessary in taking the reports of keepers and others as to the existence of the Wild Cat in the Hebrides; and these remarks apply equally to the reports of the presence of Wild Cats in many other districts besides North Britain:—

“Of many entries of ‘Wild Cats’ in the very complete list of vermin killed between 1876 and 1885 inclusive (furnished by the courtesy of the Chamberlain of the Lews, Mr. W. Mackay) not one can be held as applicable to the true wild species; and we mention this here in order to set up a guide-post to others in all future collections of similar statistics. The said records present a steadily increasing crop of cats averaging 28·7 (*sic*) for ten years, there being 30 killed in 1876 and 41 in 1885; now from all the records of true Wild Cats that we possess (and of these we have a large number from many parts of Scotland) such an increase is most unlikely, if not actually impossible, and besides our own observations, we have a still higher authority in the late Mr. E. R. Alston, all pointing to the fact that *Felis catus* has not existed in the Outer Hebrides within historic times.”

THE WILD CAT NOT INDIGENOUS TO IRELAND (?) *.

THE Wild Cat (*F. catus*) is not indigenous to Ireland, although it is stated by many naturalists who have written on the subject that it is found in the mountainous districts of that country. Sir W. JARDINE, for instance, states, in the 'Naturalist's Library,' vol. ii. Felinæ, that it abounds in Ireland in similar situations as in England and Scotland; and BELL, in both editions (1837 and 1874) of 'British Quadrupeds,' says: "The woody mountains of Wales and some parts of Ireland." Much later writers have continued to propagate this error.

The late Mr. THOMPSON, in his 'Natural History of Ireland,' says:—"The Wild Cat (*Felis catus*) cannot with certainty be given as a native animal." Thompson appears to have thoroughly investigated the matter, and his opinion is of great importance. He says the largest Cat he ever saw, which weighed 10 lb. 9 oz., was shot in a wild state at Shanes Castle; this specimen was *Felis catus* in everything but the form of the tail, which was not bushy at the end, and the fur, which was finer in texture. In the 'Larne Journal,' Feb. 1839, it was reported that the Wild Cat was found in Tullamore Park, and also used to frequent the shores of Ballintrae; "but on questioning Mr. Creighton, Lord Roden's gamekeeper, he informed me that he had never seen this species in Ireland." He was able to compare this Cat with two Wild Cats which had been brought to him in the

* The greater portion of the following remarks and letters on the Wild Cat in Ireland is taken from a paper read by the author at a meeting of the Zoological Society, and published in the 'Proceedings' of that Society for 1885.

flesh by his relative Mr. Langtrey, which had been killed a few days previous in Aberdeenshire; and he says it was as strong in every respect as those animals, but of a lighter grey colour, and he says the animal appeared to be a genuine hybrid between *Felis catus* and the Domestic Cat.

Further investigations since Thompson's time all tend to prove the non-existence of this species in the sister island. The late Sir VICTOR BROOKE informed the author that "A well-authenticated instance of the occurrence of the true Wild Cat in Ireland has never been recorded. Several specimens of Cats closely resembling in markings the Wild Cat have from time to time been produced as veritable examples, but upon inspection by naturalists they have invariably proved to be descendants of tame Cats run wild, perhaps for several generations. These beasts attain a great size, and very closely assimilate to the true Wild Cat in their form and coloration."

Mr. LA TOUCHE writes:—"I have just received your letter. Last Sunday I met one of my Galway cousins, and he told me that he remembered when he was a boy the County Grand Jury gave money for heads of Wild Cats, which were supposed to be most numerous and destructive, and that he well remembered his father's keeper (his father was Sir John Burke, of Marble Hill, county Galway) often getting this money. I asked him if he ever saw the Cats, and he says he recollects being shown one or two, and they were *Martens*, always called Cats by Irish keepers."

Dr. KENNEDY writes:—"I do not believe in the existence of the true *Felis catus*, or Wild Cat, as indigenous in Ireland, although Knox, Maxwell, and

others state that they have seen them ; all I know is that Carte, our highest authority here (curator of the Dublin Society's Museum), has been trying for years to get a specimen of it without success. The examples alluded to are, I imagine, wild tame Cats such as you and I have seen prowling after birds and small vermin in the woods, which do much mischief in this way ; but they are smaller than the Wild Cat and have not the short bushy tail. Your friend will find in Thompson's 'Natural History of Ireland' all that can be said in favour of the Wild Cat existing in Ireland, but that is not conclusive."

Sir J. W. WILDE writes:—"I have known a great number of Cats in my time—gentle, tame, spiteful, venomous, vicious, cruel, clean, dirty, honest, stealing, &c. ; but I never saw a Wild Cat, certainly not in the west of Ireland ; all Cats I saw there were evidently tame ones that had got into the rocks and become wild."

In another letter he says:—"Mr. La Touche has asked me to communicate with you respecting the existence of the Wild Cat in Ireland. I never met with such an animal, although, both as a sportsman and somewhat of a naturalist, I have had ample opportunities for observation. There is no purely Irish name for Cat, for the word Catt, or, as it is pronounced, Catta, is a mere corruption of the English term. In the 'Proceedings' of the Royal Irish Academy for 1860 you will find a lengthened essay of mine upon the unmanufactured animal remains then belonging to that institution ; it contains much curious information on the ancient animals of Ireland. That the Domestic Cat has occasionally strayed from home and gone wild is quite true ; and

instances of the kind occurred in my place in Connemara some years ago, where in a cave by the lakeside a Cat brought up her young, and, frightened by the dogs, would never come near the house again.

“The only ancient reference which I can now lay hands on is that of the ancient Irish poem treated of in the tract already referred to, where it is said two Cats were procured from the cave of Ratticrohan, in county Roscommon, but I see no reason for believing that they were originally wild. The word used in the original MSS. is *Chait*, but it is evidently a corruption of the English term.”

RECORDS OF THE WILD CAT ON THE
CONTINENT OF EUROPE.

ON the Continent of Europe, where the Wild Cat was formerly common enough, this animal has now become extremely rare, and in many districts is quite extinct.

The cause for this cannot be ascribed so much to the hand of man as in this country. Owing to the existence of vast tracts of forests and mountains there is not the same facility nor the same inducement in the way of game-preserving for its destruction, and yet the old genuine species is rapidly diminishing.

Other causes must be at work. One, no doubt, is the increased cultivation of the land, and with this the increase of population in many districts which but a few years since were barren tracts, almost, if not entirely, uninhabited. Yet in many of these districts, where this animal is on the point of extirpation, the Wolf, the Fox, and most of the smaller Carnivora are still to be found; some of them, even, are very numerous.

The increase of population is usually accompanied by the advent of the Domestic Cat, and it appears pretty certain that wherever that foreign race penetrates the old race diminishes; it is possible that this circumstance may be one of the chief factors in its eventual total disappearance, a mixed race, the result of the interbreeding of the two races, taking its place.

IN FRANCE.—When BUFFON wrote his 'Histoire Naturelle' in 1755, the Wild Cat was not uncommon, and SONNINI says that one was killed in the neigh-

bourhood of Paris, and was preserved in the Cabinet of Natural History.

Dr. CHENU ('Hist. Nat.' 1855, vol. ii. p. 187) says that the Wild Cat has become extremely rare in France during the last sixty years, and is now only found in some of the great woods in the Partie Méridionale. M. PAUL GERVAIS, writing in the same year, states that it is to be found in considerable numbers in the forests of the different Departments. M. ERNEST OLIVIER ('Essai sur la Faune de l'Allier,' 1877) reports that *Felis catus* is still to be found in some of the woods and forests of the Department, but in diminished numbers; and the same author ('Faune du Doubs,' 1883) says that it is occasionally found in the forests, but more frequently in the higher mountains.

I have lately examined two skins labelled Wild Cats sent from the Department of the Haute-Marne, near the Vosges; from the form of the skulls and the absence of many of the characteristic marks of *Felis catus*, with the exception of the fur, which is very thick and close (a necessary result of feral life), I believe they are the offspring of Domestic Cats which have run wild.

IN BELGIUM.—In the western portion of the slate plateau of the Lower Rhine, extending over portions of Belgium, France, and Rhenish Prussia, commonly known as the Ardennes, in which are large tracts of oak and beech forests, the Wild Cat, writes M. DE SELYS-LONGCHAMPS ('Faune Belge,' première partie, 1842), is not very rare, and is occasionally found in the woods of Condroz and in the Forest of Soigné; but it must not, he says, be confounded with the Domestic Cat which has taken to the woods.

In the Oxford Museum there is a specimen of a Wild Cat shot in the Ardennes by Leopold I., King of the Belgians, and presented by him in February 1864. It is of a light grey colour, and with much white about the throat and neck and on the fore legs; it is evidently the offspring of Domestic Cats run wild, probably of the third or fourth generation.

M. ALPHONSE DE LA FONTAINE ('Faune du Pays de Luxembourg,' 1862) mentions the Ardennes as its habitat, and other localities, as the Canton d'Echternach, the Forest of Grevenmacher, and the rocks of Manternach.

IN SWITZERLAND.—The Wild Cat is, or was, still to be found in some of the Cantons. GESNER, writing in 1551 ('Hist. Anim.'), says that *Felis sylvestris* is to be found in considerable numbers amongst the forests and mountains, and is fond of frequenting small brakes in proximity to water.

Le Frère OGÉRIEN ('Histoire Nat. du Jura, Zoolog. viv.,' 1863) states that the Wild Cat, happily becoming more rare, inhabits the forests of La Serre, Le Chaux, and the environs of Clairvaux; examples having been killed almost every year.

T. G. BONNEY ('The Alpine Regions of Switzerland and neighbouring Countries,' 1868) says that the Wild Cat still lingers in the most unfrequented parts of Switzerland, being commonest in the Alps of Glarus and in the forests of the Canton Bâle.

VICTOR FATIO ('Faune des Vertébrés de la Suisse,' 1869) says that the true Wild Cat is not at all common, but that it exists in the forests in the centre of Switzerland, in the Cantons of Berne, Lucerne, Unterwald, Schwyz, and Glarus, also in the Chain of the Jura from Geneva to Bâle. It has not

been seen in the Grisons for many years ; and in the Canton Tessin, where it was formerly plentiful, its place has been taken by Domestic Cats, which have become more or less wild.

IN GERMANY.—Professor J. H. BLASIUS ('Naturgeschichte der Säugethiere Deutschlands,' 1857) states that the Wild Cat is to be found frequently in the Hartz Mountains, and, perhaps more than anywhere else, in the totally unpopulated forests of the Central Carpathians. Nevertheless, he says, it wanders miles away from such places, which must be considered its proper home, and roams in the plains below. It is also found north of the Hartz, in Westphalia, Hanover, Brunswick, and in West Prussia. It prefers extensive mountain-forests, and particularly pine-forests.

JEITTELES ('Prodr. Faun. Vert. Hung. Super.,' 1862) states that the Wild Cat is still found in Upper Hungary, and he has known it breed with the Domestic Cat. In the forests and mountains of Transylvania the original species still lingers, but is getting scarcer every year.

IN ITALY.—The Wild Cat is becoming extremely rare. G. F. VILLARDI ('Fauna d' Italia,' pt. i., 1871) says that the Museum at Milan possesses only two specimens from Italian localities—one from the mountains above the Lago Maggiore, killed in 1868, and the other from the Island of Sardinia.

IN SPAIN.—Lord LILFORD writes :—"In Andalucia, and, I believe, in other parts of Spain, the Wild Cat is numerous, and I have obtained several skins from that country. In my experience in Southern Spain the Cat is generally found in dense thickets in the neighbourhood of marshes. The Wild Cat in Spain is generally known as Gato montés, whilst *Felis*

pardina, the Spotted Lynx, is called Gato cervical or simply Gato, or Gato clavo, but this latter appellation is also sometimes bestowed upon the Wild Cat."

Messrs. ABEL CHAPMAN and W. J. BUCK ('Wild Spain,' 1893) say that Wild Cats are common throughout Spain wherever rabbits abound. They go by the names "Gato montés," "Gato castellano" or "romano."

IN THE CAUCASUS.—The Wild Cat has frequently been taken as far as the Caspian, and in Western Russia it is not uncommon.

IN GREECE.—It is found in Macedonia and other parts of the kingdom, and has been killed in the vicinity of Athens.

SOME PARTS OF ASIA MINOR.—In the northern continuation of the Lebanon Range and Eastern Taurus Range, near Marash, a Cat very closely allied if not identical with the European Cat has been met with, very different to that from Trebizond and Erzeroom. Instead of being of an unusually clear grey colour marked with distinct spots, it is of a tawny colour faintly but regularly brindled with a dark rufous-grey, with a distinct black stripe along the upper surface of the tail, with imperfect dark rings and black tip.

IN TURKEY IN EUROPE (the Balkan Peninsula).—Lord LILFORD writes:—"In what we used to call Albania, *i. e.*, the province of Epirus, the mainland opposite to Corfu, we used frequently to meet with Wild Cats when we were shooting; and I well remember rolling over a very fine old male that came out of a strip of thorn covert, hotly pursued by our spaniels, in the valley of Butrinto; this animal's stomach was full of the remains of woodcocks."

IN SCANDINAVIA.—The Wild Cat is not found, although naturalists have adopted the name *Felis catus*, by which it is generally known, from Linnæus, a Swedish naturalist; its place is taken by the Northern Lynx (*Felis lynx*). PONTOPPIDAN, no doubt, means this animal when he says:—"We have Cats both tame and wild; the latter are very large, and their skins bear a good price. They live by catching birds upon the trees; they steal upon them and then seize them by a sudden leap."

DESCRIPTION.

ALTHOUGH some of the early writers on Natural History, as ALBERTUS MAGNUS, mention the Wild Cat, it is chiefly in reference to the medicinal effects of certain parts of the animal on the diseases of humanity, as in podagra, &c.

The first general description of this animal is in GESNER'S 'Historiæ Animalium,' published in 1551, where he describes one from Switzerland, where it appears at that time to have been common; he calls it *Felis sylvestris*, and states that it is similar to the Domestic Cat, only larger, with thicker and longer fur. The body is everywhere of a brown or tawny (fuscous) or, as Albertus says, grey colour, mixed with rufous on the back; a black line runs along the back, and between the breast and neck is a broad spot mixed with very white hairs. Pads of feet black. The tail thicker than that of the Domestic Cat, with two or three blackish rings; the extreme point quite black.

ALDROVANDUS, KLEIN, and others, give descriptions similar to Gesner, if they are not taken direct from his work.

DAUBENTON (Buffon's 'Histoire Naturelle, générale et particulière,' 1756) gives a fuller and very careful description of this animal, and many subsequent writers on the Natural History of the Wild Cat of Europe have taken his observations as the basis of their remarks.

THOS. BELL ('History of British Quadrupeds,' 1837), WILLIAM MACGILLIVRAY ('The Naturalist's Library,' 1838), and JOHN HEINRICH BLASIUS ('Naturgeschichte

der Säugethiere Deutschlands,' 1857) give very full general descriptions, especially the latter, who enters thoroughly into the comparison between the two races, the Wild and the Domestic.

The following description is from a Wild Cat killed in the county of Baranya, Hungary, in 1872, and sent in the flesh to the author by the late Countess BATHYANI; this district was at that time very sparsely inhabited:—

“The head rather flat, long, and comparatively narrow. The ears pointed, with long whitish-grey hairs inside; neck thick and short; body long, rather lower at the shoulders than at the hips; legs short and thick, extremely muscular. General colour on back and sides of a brown-grey on a yellowish-brown ground; three dark brownish-black stripes, commencing at the root of the nose, pass between the ears and extend down the upper part of the neck to the shoulders, one continuing along the centre of the back to the root of the tail, the other two diverge, one on each side over the shoulder, and pass to the fore legs, which are half-ringed on the upper part. The hind legs are also ringed in the same manner. Five brown stripes descend on each side of the body, easily discernible where they break off from the main stripe down the back, but soon become blended and mixed, but still perceptible, with the general colour. Two well-marked stripes extend from the angles of the eyes along each cheek. Muzzle grey, tinged with reddish brown; edge of lips dark brown. The under surface of the lower jaw, neck, and chest a uniform lightish grey. The abdomen and inner part of the thighs of a light orange fawn-colour, mixed with black-brown hairs. The tail covered

with soft thick fur, similar to the body, intermingled with longer hairs, bushy in appearance and marked with five dark brown-black annular rings, the three first undefined, the last two and the tip darker in colour, almost black; the tip about two inches in length. The posterior portion of the hind legs, up to heel-bone, black. The pads of the feet blackish, with a lighter-coloured rim."

The colour of the fur of the Wild Cat as given by different writers varies so much that it would lead one to suppose no two persons could quite agree in describing colour. GESNER says "colore fusci vel grisei"; DAUBENTON "plus ou moins mêlée de fauve, de noir et de gris blanchâtre"; BRISSON "varié de brun, de jaunâtre et de blanchâtre"; PENNANT "yellowish, mixed with grey"; BEWICK "pale yellow, mixed with grey." BINGLEY says the colour varies somewhat in different parts of Europe, all more or less striped, never spotted. TEMMINCK describes the colour as "gris foncée plus ou moins distincte suivant l'âge;" CUVIER "gris brun, avec les ondes transverses plus foncées." MACGILLIVRAY gives the colour of the fur of the upper and lateral parts as pale reddish brown; DONOVAN as a pale brown, varied with grey; BLASIUS a rusty yellowish grey. BELL describes the general colour as grey, darker on the back, paler on the sides; ELLIOT as dark grey; BREHM says a dull grey, sometimes shading to black-grey in the male, yellow-grey in the female; KINGSLEY says usually yellowish grey; ABEL CHAPMAN "the general colour of the Wild Cat in Spain is a brindled grey, with black stripes."

Mr. POPE has made some interesting observations on the variation of colour in the Domestic race (see

‘Zoologist,’ Sept. 1881); he says that the colours, broadly speaking, are of two distinct patterns, to which the markings of all coloured Cats can be referred, for, with the exception of white ones, all may be said to be tabby—that is, they are marked with two distinct shades, a light and a dark one, disposed according to one or two patterns.

Pattern 1, he says, approaches that which is seen on the fur of the Wild Cat, which he designates as “tiger-striped,” to distinguish it from the usual tabby, but is more like the Serval than the Tiger, the darker markings on the dorsal line being often split into three; the lighter of the two tints forms the ground-colour.

Pattern 2. The relation of the two shades to each other is reversed; the general rule for the greater part of the fur, light markings on a darker ground, disposed, with the exception of those on the face, legs, and chest, in a manner totally different to No. 1. This he calls “ring-tabby,” from the invariable presence of a large ring of the lighter of the two shades, more or less perfect, situated on the side of the body a little in front of the flanks.

Both these patterns are often seen on the skins of tabby Cats which have been labelled Wild Cats.

The external form of the head of *Felis catus* is described by PENNANT as larger and flatter than that of the Domestic Cat; by DONOVAN as broad and flat; by MACGILLIVRAY as short, broad, convex above, and triangular; by BELL as triangular and strongly marked; and by other authors as larger and rounder than the Domestic Cat. The discrepancy can be accounted for, in some measure, by the variation in the form of the cranium and the frontal bones.

The form and thickness of the fur and shortness of the tail have also been held by many as specific characters.

The terms black and white, often used by the earlier writers, must not be taken too literally. PENNANT and BEWICK say that the tail of the Wild Cat is marked with black and white, and others have employed the same words in their descriptions: blackish brown and whitish grey would be much more appropriate terms, the grey becoming more light and a black-brown becoming more brown as years increase.

The so-called black rings on the tail of the Wild Cat are generally of a dark black-brown colour when held up to the light, whilst the rings on the tail of a domestic tabby are black.

The tail of the Domestic Cat, as MACGILLIVRAY points out, seems longer and more tapering, because the fur is thinner and shorter; but individuals of the Domestic race are sometimes met with which exhibit scarcely any difference from the Wild Cat. DAUBENTON describes a variety of the Domestic Cat which has the tips of the tail and the pads of the feet black; one sees, he says, Domestic Cats which have the black bands on the body and the annular rings of the same colour on the tail and limbs, but the fur is less "fauve," the grey predominating; the fur is shorter than in the Wild Cat, and consequently the head, body, and particularly the tail appear less large.

The measurement of a number of tails of the Wild Cat and of the Domestic Cat gives a range between 11 inches and $14\frac{1}{2}$ inches, the longer length being quite as often found in the Wild Cats as in the

Domestic. The bushy appearance depends entirely on the length of the fur, and accords with the thick fur of the rest of the body of the Wild Cat, whilst in the Domestic race the fur both on the body and tail is thinner and softer*.

* I have lately had the opportunity of examining the skin of a young Cat known to have been the offspring of two Domestic Cats which had taken to a wild life; it was shot coming out of a rabbit-burrow on the Perthshire moors. The tail was very bushy and looked very short; the colour of the fur, body, and tail of a yellowish tabby, with some white marks; the stripes down the back and on the flanks were visible, but not strongly developed.

SIZE, LENGTH, AND HEIGHT OF *FELIS CATUS*.

THE size of the Wild Cat has been much exaggerated. PENNANT states that it is three times the size of the Domestic Cat, "with feet and claws tremendous." This would make the Wild Cat somewhat about seven feet long and three feet high: well may he call it the British Tiger. WRIGHT, in his edition of Buffon, says that the Wild or Wood Cat at its full growth stands a foot and a half high and measures two feet round the body, and, including the tail, which is half a yard long, is about four feet in length. BEWICK records one having been killed in Cumberland upwards of five feet in length.

Sir W. JARDINE remarks: "We have never been so fortunate as to find a specimen of such extraordinary dimensions, nor should we wish to encounter a Wild Cat so nearly approaching the size of a Puma or Leopard."

GESNER gives the whole length as "quatuor do-drantum," or about three feet.

DAUBENTON gives the extreme length of the Wild Cat as 2 feet 8 inches 3 lines; the length of the tail being 11 inches 3 lines—that of the Domestic being 10 inches 3 lines, or 1 inch shorter than *F. catus*; the whole length of the Domestic Cat is 2 feet 5 inches 6 lines.

TEMMINCK considers that the size of Wild Cats varies according to the situation they inhabit: those of the "Midi" are scarcely larger than the common Domestic Cat; those inhabiting the vast forests of the centre of Europe are much larger and stronger, averaging from 2 feet 8 inches to 3 feet, including the tail, which is about 12 inches.

FLEMING gives the length from tip of nose to base of tail as 2 feet 4 inches, the tail 1 foot 5 inches, total length 3 feet 9 inches, and the extreme height 15 inches.

JENYNS gives the length of the head and body of the male as 2 feet 3 inches 9 lines, the length of the tail 1 foot 1 inch 6 lines, the extreme length 3 feet 5 inches 3 lines, and the extreme length of the female 1 foot 9 inches 3 lines.

MACGILLIVRAY gives the extreme length of the male, including the tail, as 3 feet 4 inches, the tail being 14 inches; the extreme length of a female as 2 feet 6 inches, the tail being 10 inches. Another male, killed in Stirlingshire, the extreme length 2 feet 11 inches, the tail being $12\frac{1}{2}$ inches.

BLASIUS gives the extreme length of the male, including the tail, as 2 feet 10 inches 6 lines, the tail being 11 inches 6 lines.

Mr. A. HENEAGE COCKS gives the extreme length of the male, including tail, as 3 feet $3\frac{1}{2}$ inches; the female 3 feet 2 inches; a young adult female 2 feet 10 inches, another 2 feet 9 inches.

BELL says that the dimensions of the Wild Cat differ greatly if we take the statements of various naturalists. The medium size of a full-grown male is 1 foot 10 inches, tail 11 inches 2 lines, extreme length 2 feet 9 inches 2 lines.

A full-grown male from Hungary measured in the flesh 3 feet 1 inch, including the tail, which was 12 inches. A full-grown male from Scotland measured in the flesh 2 feet 11 inches, including the tail, which was 12 inches.

The extreme length of a full-grown well-fed male of the Domestic race was 2 feet 10 inches, including the

tail, which was 11 inches 2 lines ; another example measured 2 feet 3 inches, including the tail, which was $12\frac{1}{2}$ inches. DAUBENTON gives the dimensions of a Domestic Cat as 2 feet 5 inches 6 lines (French measure).

The height of a large male Wild Cat varies from $12\frac{1}{2}$ to 13 inches at the hips and from 12 to $12\frac{1}{2}$ inches at the shoulders.

The height of large well-fed male Domestic Cats varies from 12 to $14\frac{1}{2}$ inches.

Some of the Feral Cats which are now occasionally found in Scotland measure from 13 to 14 inches in height, and, including the tail, 3 feet 2 inches to 3 feet 4 inches in length—the tail being very bushy and the rings black.

The weight of a male Wild Cat seldom exceeds 10 pounds ; that of large male Domestic Cats run from 10 to 23 pounds.

The dark colour of the pads was regarded by TEMMINCK as a distinctive character of the male of *Felis catus*.

Dr. ALFRED NEHRING ('Berlin. Gesellschaft naturforschender Freunde,' May 1887), in his remarks on the colour of the soles of the hind feet of *F. catus*, *F. caligata*, and *F. domestica*, considers that there is a permanent difference between the Wild Cat of Europe and *F. caligata* and *F. maniculata*, in the extent of the black colour of the pads of the toes and the posterior surface of the foot up to the os calcis or heel-bone. In *F. caligata* and the closely allied *F. maniculata* the pads of the toes are quite black, and this colour extends wholly or in long black stripes up to the heel-bone ; while the true European Wild Cat, so far as his investigations go, only shows a

relatively small round spot of black on the pads, and the colour as far up as the os calcis is of yellowish or yellow grey; and our Domestic Cats, which retain the colour of the fur of the wild race, correspond in the colouring of the soles and feet invariably with *F. caligata* and *F. maniculata*, and not with *F. catus*, a circumstance, he says, “which speaks for the descent of our Domestic Cat from African Cats or from the closely allied South Asiatic races.”

Fig. 11.

Fig. 12.



Fig. 11.—The right hind leg of a wild-coloured (“wildfarbigen”) Domestic Cat, as is found also in *Felis caligata* and *F. maniculata*.

Fig. 12.—The right hind leg of a European Wild Cat.

In twelve skins, labelled Wild Cats, examined in the Natural History Department of the British Museum, S. Kensington, four—viz., one from Greece and three from Scotland—had black pads to the soles, a light yellowish-grey fur to the heel; while eight—viz., two from Sardinia, one from the Caucasus, one from Hungary, and four from Scotland—had black toe-pads and dark black-brown fur to the heel-bone.

THE FORM OF CRANIUM AND OTHER BONES
OF THE SKULL.

VARIATION in the form of the skull of the European Wild Cat is very perceptible when examining a number of examples.

In some (1) the skulls are long and narrow; the cranium is compressed and elongated; the frontal bones are narrow and depressed, concave in the centre and flat; the occipital ridge jagged and thick; the sagittal (parietal) ridge well marked, extending sometimes as far as the coronal suture, generally a little more than halfway. The external bones of the skull are firmly welded together and dense. See fig. 13.

The basal length ranges from 85 to 91 mm.

The breadth over the parietal bones 44 to 47 mm.*

In others (2) the skulls are shorter and broader; the cranium round and bulging; the frontal bones broad, convex, or flat; the occipital ridge thin and less jagged; the sagittal ridge short or absent; the bones of the external portion of the skull thinner. See fig. 14.

The basal length from 78 to 84 mm.

The breadth over the parietal bones 47 to 53 mm.

In seven examples of African Cats labelled *F. caligata* and *F. maniculata* the skulls were short and

* The measurements were taken by compass: the basal length from the insertion of the incisors in the upper jaw to the anterior edge of the foramen magnum; the breadth from the posterior insertion of the zygomatic process to the opposite side.

broad; the cranium bulging and round; the frontal bones broad and flat; the sagittal ridge very short.

Basal length from 77 to 81 mm.

Breadth over parietals ... 57 to 58 mm.

In two skulls of *F. maniculata* from Suakin the cranium was rounded and bulging; the frontal bones broad and flat; sagittal ridge very short.

Basal length 81 and 83 mm.

Breadth over parietals ... 48 and 49 mm.

In seven examples of skulls of Domestic Cats from various sources the form of the cranium was round and bulging; the frontal bones broad and flat; the sagittal ridge very short or wanting; the external bones thin. See fig. 15.

Basal length from 73 to 83 mm.

Breadth over parietals ... 45 to 48 mm.

Two examples of the Mummy Cat from Egypt.* In No. 1 the form of the skull was narrow and elongated; the cranium somewhat bulging; the frontal bones broad and flat; the sagittal ridge extending along the parietals halfway to coronal suture and thick.

Basal length 94 mm.

Breadth over parietals ... 55 mm.

In No. 2 the form of the skull was short and broad; frontal bones broad and slightly concave; sagittal ridge short and thin. See fig. 16.

Basal length 83 mm.

Breadth over parietals ... 46 mm.

* Dr. ALFRED NEHRING, in his paper on the Egyptian Cats from Bubastis, Beni Hassan, and Siut ('Verhandlungen der Berl. anthrop. Gesellschaft,' July 20, 1889), considers the larger mummy skulls are similar to *F. cal gata*, *F. chaus*, and the smaller to *F. maniculata*.

Fig. 13.

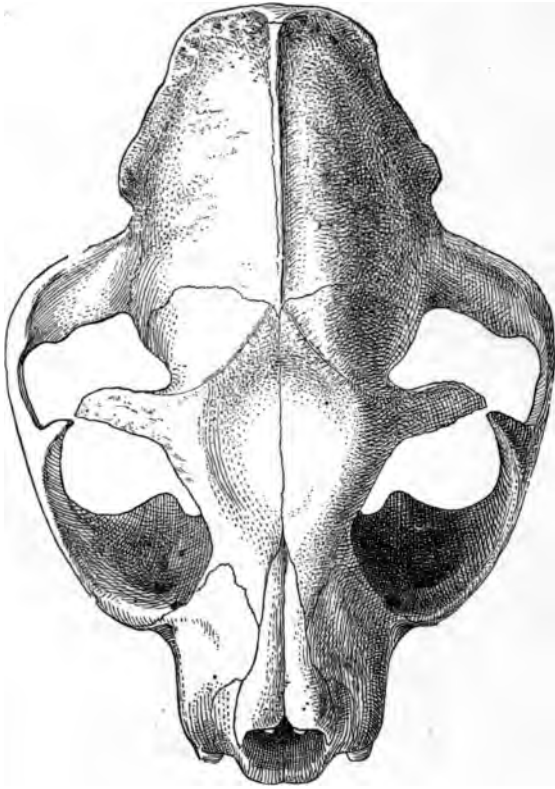
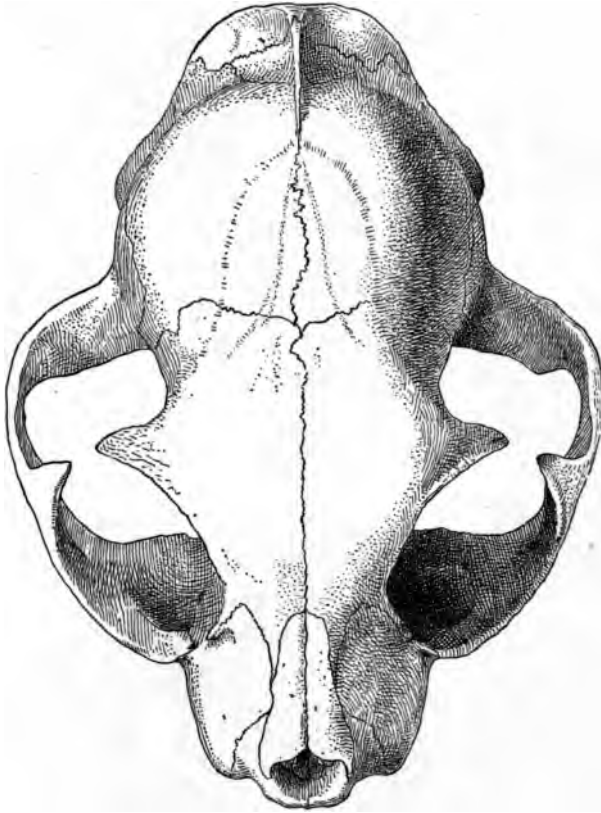
Skull of *Felis catus* (Form 1), ♂. Nat. size.

Fig. 14.



Skull of *Felis catus* (Form 2), ♂. Nat. size.

Fig. 15.

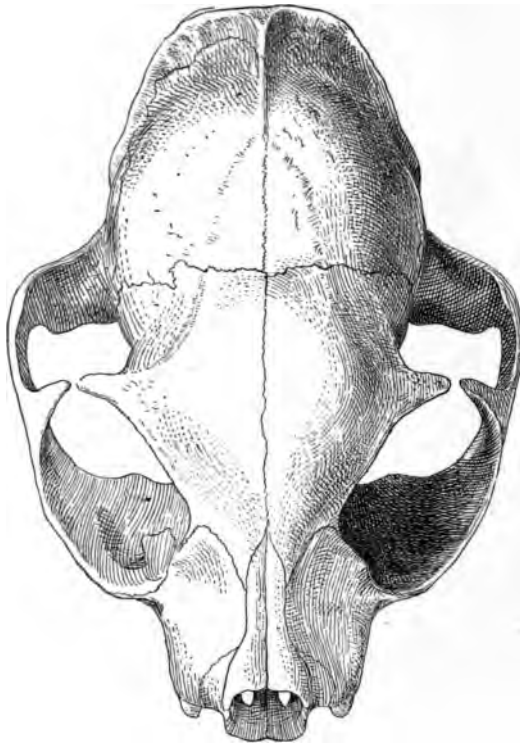
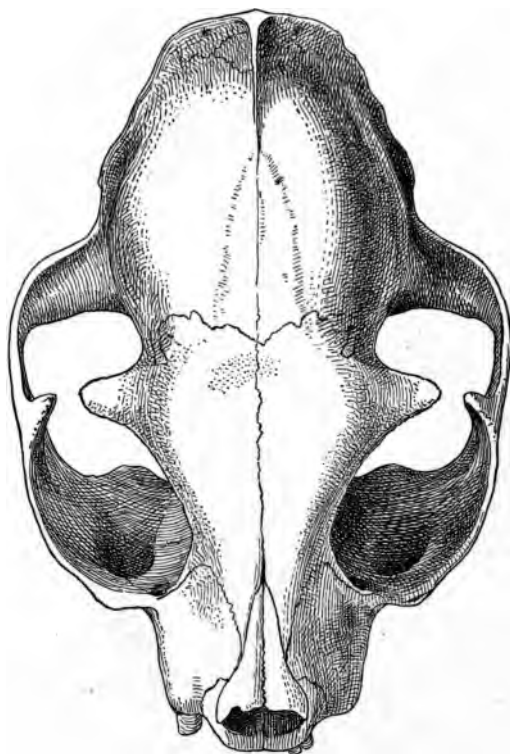
Skull of *Felis domestica*, ♂. Nat. size.

Fig. 16.



Skull of a Mummy Cat (*Felis maniculata*)? Nat. size.

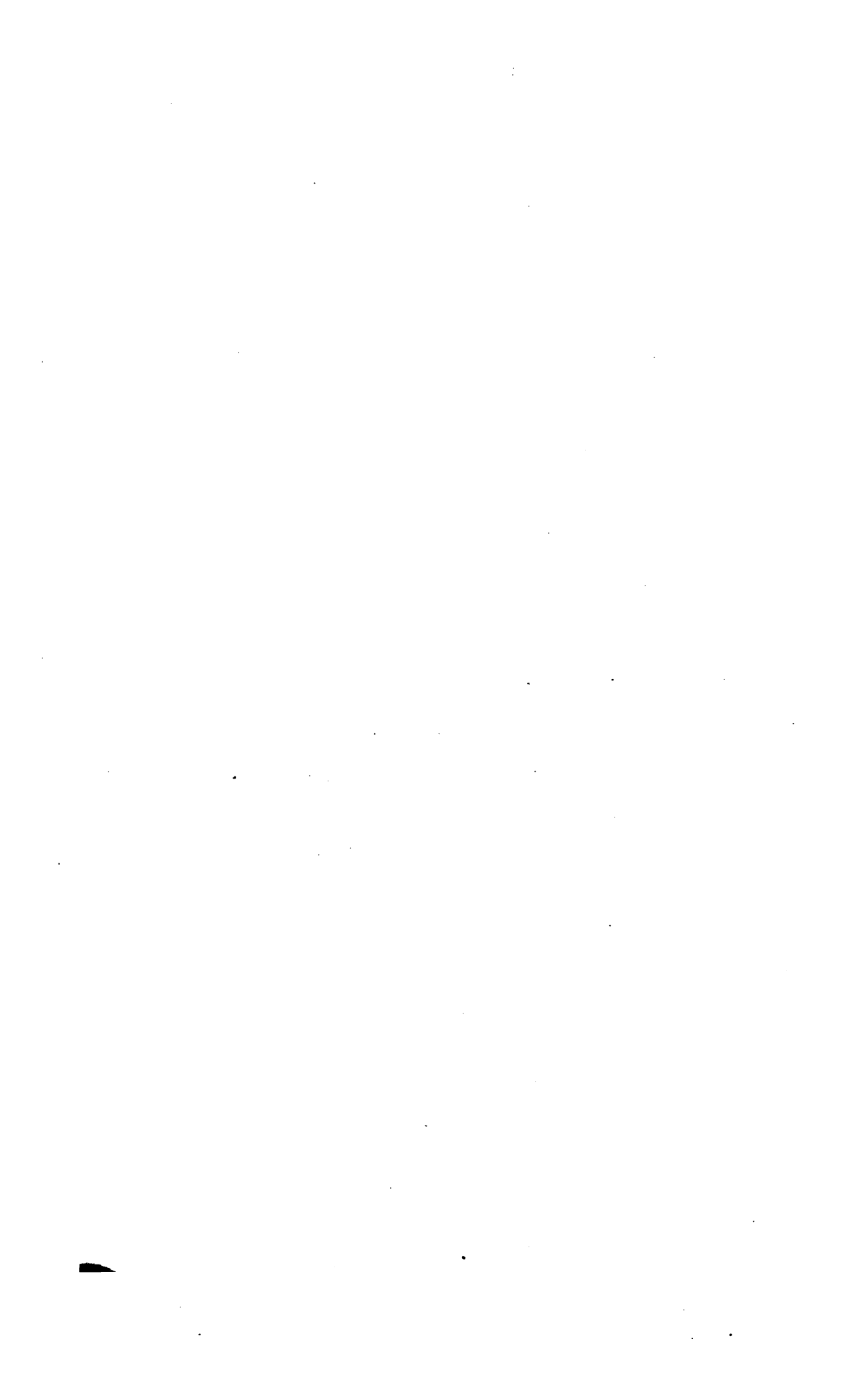
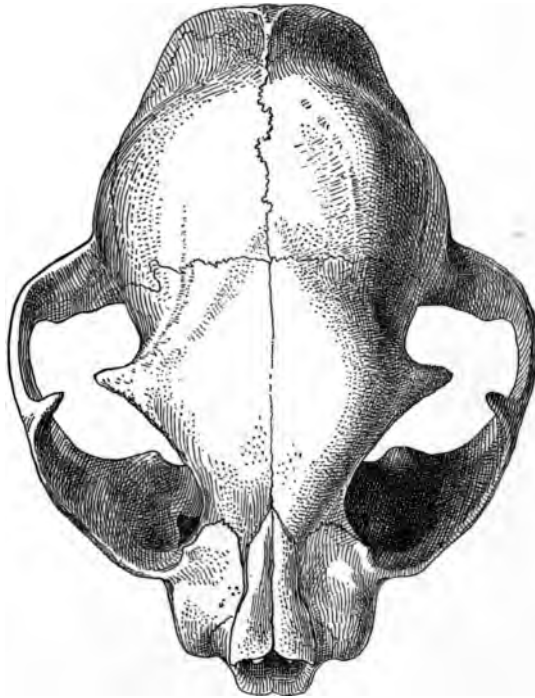


Fig. 17.



Skull of a Mongrel Cat, between *Felis catus* and *Felis domestica*.
Nat. size.



No. 1 appears to be similar to the skull of *F. chaus*, and No. 2 to that of *F. maniculata* and somewhat like that of *F. domestica*.

In two examples of well-authenticated hybrids (more properly mongrels) between the Wild Cat and the Domestic Cat, the form of the skull was short and broad; the cranium round and bulging; the frontal bones broad and flat; the external bones of the skull somewhat thin; the sagittal ridge very short. See Fig. 17.

The basal length 77 mm. in both.

Breadth over parietals... 48 mm.

In the skulls of Pleistocene Cats found in the caverns of Engis, in the province of Liège, the basal length ranges from 68 to 77 mm., and the breadth from 39 to 42 mm. The sagittal ridge was present in all more or less, ranging from 12 to 23 mm. (See figs. 9 and 10.)

THE NASAL BONES.

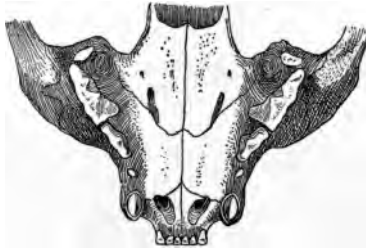
BLASIUS, in his description of the Wild Cat, states that the nasal bones extend further into the frontal bones than is the case in the Domestic Cat. This, however, is not at all persistent, and cannot be taken as a specific character. Out of ten examples of the Wild Cat, in six the nasal bones extended into the frontal bones beyond the insertion of the nasal process of the upper maxilla, in two they were on the same level, and in two below; and out of ten examples of the Domestic Cat, five extended beyond, three were level, and two below.

Blasius also makes a distinction between the two races in respect of the frontal bones; in the Wild

Cat he says that they come in contact with the temporals behind the orbital fossæ, whilst in the Domestic race they are separated by the parietal process. The examination of ten examples of both races shows these variations to exist just as often in one as the other. ELLIOT, in his 'Monograph of the Felidæ,' states: "In some skulls the frontals and squamosals are in contact, but not always so; these parts are sometimes separated by the processes of the parietal and ala sphenoid."

The variation in the position of the second premolar tooth is another distinction claimed by BLASIUS as specific*. He states that in the Wild Cat the surface of the second premolar of the upper jaw is in direct line with that of the third or sectorial tooth (see fig. 18), whilst in the Domestic Cat the anterior

Fig. 18.



external lobe of the sectorial tooth protrudes outwards from the second premolar and is not in line (see fig. 19).

The examination of the teeth of ten skulls of the

* The first premolar of the upper jaw of the permanent teeth is generally very rudimentary, but occasionally it has two crowns instead of one. Two instances have come under notice in examining a number of skulls.

Wild Cat from different parts of Europe gave the following results:—

In seven the teeth of the upper jaw were in *direct line*.

In two the anterior lobe *protruded*.

In one the teeth were even on one side, *protruding* on the other.

In ten skulls of the Domestic Cat:—

In five the teeth of the upper jaw were in *direct line*.

In four the anterior lobe *protruded*.

In one the teeth were even on one side and protruded on the other.

Fig. 19.



Dr. NEHRING, *l. c.*, points out another difference between the Wild and Domestic race, viz., that the flesh-tooth in the lower jaw of the latter always appears shorter and more delicately formed than in the former. This he does not consider specific, but is the result of domestication.

VARIATIONS IN THE SKELETON.

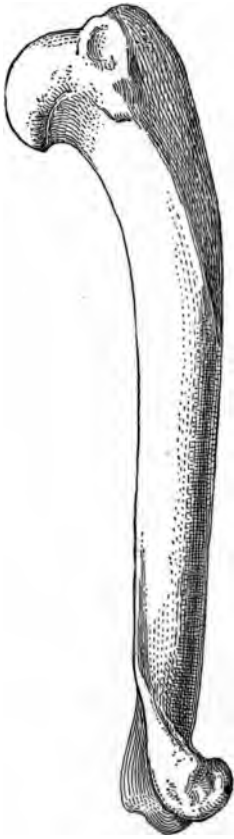
THE caudal vertebræ vary from 19 to 23, both in the Wild and the Domestic race. The length of the tail has been regarded by many writers as a specific character between the two, the Wild Cat having a shorter tail; but the number of vertebræ is generally found to vary equally in both races.

The examination of the skeletons of *Felis catus* and *Felis domestica* does not coincide with the general opinion that the Wild is a much larger animal than the Domestic Cat. The measurements give some slight difference in the height, but this is not always in favour of the wild race. The vertebral column is the same. The pelvis shows a slight variation in length—89.5 mm. in *Felis catus*, 88 mm. in *Felis domestica*. There is some variation in the bones of the extremities; but this, again, is often in favour of the Domestic race; but the strength and thickness of these bones are always greater in the Wild Cat.

The following measurements are taken from the skeleton of a full-grown male *Felis catus* from Hungary and a full-grown well-fed male of *Felis domestica* (see figs. 20 to 31):—

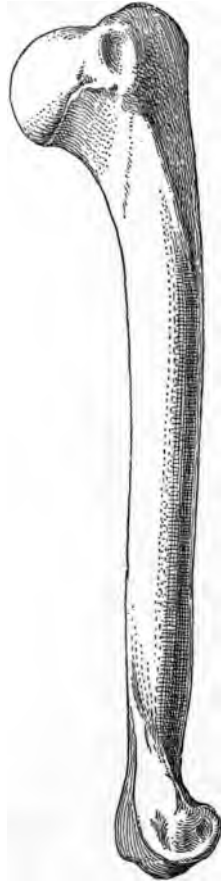
<i>Wild Cat.</i>		<i>Domestic Cat.</i>	
	mm.		mm.
Humerus	110	Humerus	115
Ulna	122	Ulna	127
Radius	98	Radius	109
Femur	120	Femur	125
Tibia	128	Tibia	134
Fibula	116	Fibula	125

Fig. 20.



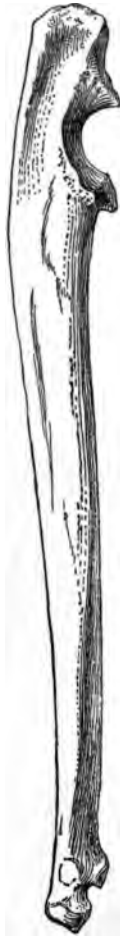
Humerus of *Felis catus*.
Nat. size.

Fig. 21.



Humerus of Domestic Cat.
Nat. size.

Fig. 22.



Ulna of *Felis catus*.
Nat. size.

Fig. 23.



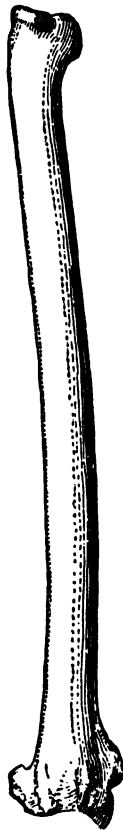
Ulna of Domestic Cat.
Nat. size.

Fig. 24.



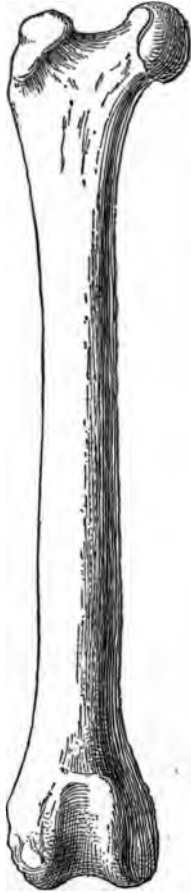
Radius of *Felis catus*.
Nat. size.

Fig. 25.



Radius of Domestic Cat.
Nat. size.

Fig. 26.



Femur of *Felis catus*.
Nat. size.

Fig. 27.



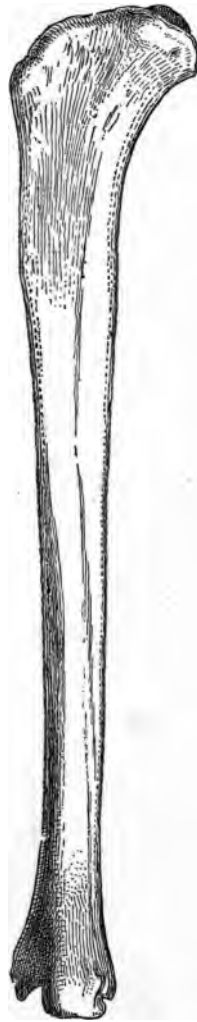
Femur of Domestic Cat.
Nat. size.

Fig. 28.



Tibia of *Felis catus*.
Nat. size.

Fig. 29.



Tibia of Domestic Cat.
Nat. size.

Fig. 30.



Fibula of *Felis catus*.
Nat. size.

Fig. 31.



Fibula of Domestic Cat.
Nat. size.

Dr. ALFRED NEHRING, of Berlin, sends the measurements of the bones of the extremities of a Wild Cat (in his possession): the humerus measured 121 mm., the radius 118 mm., the ulna 137 mm., the femur 137 mm., the tibia 139 mm. The skull and other bones were wanting.

LENGTH OF THE INTESTINAL CANAL.

DAUBENTON, in 1756, first noticed the difference in the length of the intestinal canal between the Wild and the Domestic Cat. He found that the length of the small intestine from the pylorus to the cæcum in the Wild Cat was 3 feet 2 inches, while that of the Domestic was 5 feet 9 inches (Fr.). The total length of both large and small intestines in the Wild Cat was 4 feet 1 inch, in the Domestic 6 feet 9 inches.

Professor MIVART states that the whole intestinal canal in the Domestic Cat is about five times the length of the whole body, though it is considerably shorter in the Wild Cat.

Mr. HARRISON WEIR ('Our Cats and all about them') states that the intestines of the Domestic Cat are nine times the length of its body, whilst in the Wild Cat they were little more than three times the length.

The difference in the length is chiefly found to be in the small intestine, the length of the colon and rectum being nearly the same in both races.

ISIDORE GEOFF. ST.-HILAIRE, in his 'Histoire Nat. gén. des Règnes Organiques,' t. iii. (1854-62), has the following remarks on Daubenton's discovery:—

“ Il est vrai que Daubenton a comparé les races félines au chat sauvage d'Europe, et non à l'espèce qui en est la souche principale, le Chat ganté. Mais le groupe des chats proprement dits est tellement naturel qu'une de ses espèces, quelle qu'elle soit, peut représenter anatomiquement toutes les autres. Il est néanmoins à désirer que les voyageurs en Abyssinie et en Nubie ne négligent pas l'occasion d'examiner, ou de nous mettre à même d'examiner, le tube digestif chez le *Felis maniculata*, à fin de changer

en une verité d'observation ce qui n'est encore qu'une présomption extrêmement vraisemblable."

St.-Hilaire's suggestion appears never to have been acted upon. There is no record, so far as I am aware, of any measurement having been made of the intestines of the African Cats, wild or domestic. With the hope of being able to settle this question, at the suggestion of Dr. P. L. Sclater, Mr. J. C. Mitchell, Professor of Zoology in the College of Agriculture at Gizeh, near Cairo, was applied to, and he has most kindly sent the following measurements of the intestinal canal of *Felis chaus* and the Egyptian Domestic Cat; he was not able to procure an example of the *Felis maniculata* in the flesh*. The Egyptian Domestic Cat has been much crossed with imported Domestic Cats of different kinds, but that which he examined he considered to be one of the pure breed.

1. *Felis chaus* ♂.

	centim.	ft.	in.	lin.
Length of small intestine . .	127·5	=	4	2 0
,, large intestine . .	34·0	=	1	1 3
	161·5		5	3 3
The entire length of the body including the tail	103·0	=	3	4 5

2. *Felis chaus* ♀.

Length of small intestine . .	133·5	=	4	4 6
,, large intestine . .	35·3	=	1	2 0
	168·8		5	6 6
Length of body including the tail	97·0	=	3	2 2

* *F. chaus*, *F. caligata*, and *F. caffra* are considered by some authors to be synonymous.

3. *Felis domestica* (Egyptian var.) ♂.

	centim.	ft.	in.	lin.
Length of small intestine . .	161·0	=	5	3 7
„ large intestine . .	27·4	=	0	10 10
			<hr/>	<hr/>
	188·4		6	2 5
Length of body including the tail			2	3 6

The entire length of the intestinal canal of four examples of the European Wild Cat from different districts measured : 5 feet ; 4 feet 6 inches ; 4 feet 1 inch ; and 3 feet 2 inches.

The entire length of the intestinal canal of two examples of the European Domestic Cat measured 6 feet 5 inches and 6 feet 7 inches.

In *Felis chaus* the length of the intestinal canal is much shorter than in the Egyptian Domestic Cat, and is somewhat longer than in *Felis catus*.

In the Egyptian Domestic Cat the length approximates to that of the intestinal canal of the Domestic Cat of Europe.

The length of the large intestine (colon) in the Egyptian Wild Cat (*Felis chaus*) is longer than in the Egyptian Domestic Cat, whilst in the European Cats it is the reverse.

DAUBENTON did not consider that this change had been produced solely by the abundance or quality of the food, but attributed it to other circumstances which the Cat finds in a state of domestication, and regarded it as “une altération de l'espèce qui a plus dégénéré dans les parties intérieures du Chat domestique que dans la figure extérieure du corps.”

DARWIN ('Animals and Plants under Domestication,' vol. ii. p. 293) considers the increased length of the intestines in the Domestic Cat is due to the food being less strictly carnivorous than in any wild feline



THE CAFFER CAT.

(*Felis caffer*?, *F. chaus*?, *F. caligata*?)

species; "for instance," he says, "I have seen a French kitten eating vegetables as readily as meat." The author had a fine Tabby Cat which for nearly five years lived almost entirely on vegetable diet, and died from a block in the intestines of a mass of food composed principally of potatoes and potato-rind, to which it was very partial; and on measuring the intestinal canal of this Cat, the small intestine was 3 inches longer than the usual dimensions found in the Domestic race. The examination of the intestinal canal of the offspring of Domestic Cats which have taken to a wild life, and which have become entirely feral, shows that it approximates closely to that of the Wild race.

PERIOD OF GESTATION.

ANOTHER supposed specific difference between the two races has been the length of the Period of Gestation. The Wild Cat is stated to go with young from 67 to 68 days; the Domestic Cat from 55 to 63 days.

Mr. HENEAGE COCKS procured two Wild Cats, male and female, from Guisachan, Ross-shire, which he kept in captivity for some four or five years. These bred every year for four successive years. "My old pair of Wild Cats," he writes, "have bred again this year (1876), and the gestation was to within an hour or two of the same time as before, *i. e.*, 10 hours less than 68 days; is it jumping at conclusions in too great a hurry to suppose that this is the regular time?"

Heneage Cocks also noticed that the kittens of the Wild Cats at birth were considerably larger than those of the Domestic Cat at the same period.

There is no other record, so far as I know, of Wild Cats breeding in confinement in this country; and there is no record of Wild Cats breeding in a state of nature which can be entirely depended upon.

Owing to their nocturnal habits and wandering propensities the precise period our Domestic Cats go with young is not easily ascertained. Most naturalists who have written on the subject give the time as 55 or 56 days. FLEMING and DONOVAN, however, state the period of gestation is 63 days. Recent inquiries amongst breeders of Cats have not resulted in clearing up the discrepancy, and they give the margin from 55 to 63 days.

It is very difficult to prove the exact date of actual fecundation. The heat-period of the female extends to 9-10 days; on any one of those days or nights the act of fecundation may take place, and thus the date of birth would be either shortened or lengthened.

ERXLEBEN ('Systema Regni Animalis,' 1777) considers that the difference is caused by the want of knowledge as to when the act of fecundation takes place.

Domestication may also produce a modification; it certainly tends to increased fertility. HERBERT SPENCER ('Principles of Biology,' vol. ii. pp. 457 *et seq.*), on the laws of multiplication, nutrition, and genesis, says:—"The best illustrations are those yielded by animals in which we have, besides an increased supply of nutriment, a diminished expenditure. Two classes of comparisons alike in these implications may be made—comparisons between tame and wild animals of the same species or genus, and comparisons between tame animals of the same species differently treated."

"Equally clear proof," he writes, "that abundant nutriment raises the rate of multiplication occurs in mammals; compare the litter of a dog (6-14) with the wolf and fox (5-6). Again, the Wild Cat has 4 or 5 kittens, while the Tame Cat has 5 or 6 three times a year, no less distinct evidence that among domesticated mammals themselves the well-fed individuals are more prolific than the ill-fed individuals."

BUFFON states that the Wild Cat, and also the Domestic Cat run wild, only produce their young once a year, whilst the Domestic Cat breeds several times during the same period.

BELLINGERI, C. F. ('Della fecondità degli Animali

Vertebrati') states that the Wild Cat breeds only once a year, and has 4 or 5 in a litter; he also remarked that in Cats which live exclusively on animal food the proportion of female kittens in 69 cases recorded was as 37 to 32.

Confinement in cages of wild animals may produce a modification of their natural habits, and may lengthen or shorten the gestation period.

Mr. BARTLETT, the able Superintendent of the Zoological Gardens, states that "the period of gestation in the Lion, the Tiger, the Leopard, and the Ocelot extends to 16 weeks, or 112 days;" but this appears to be uncertain; at the last accouchement of a lioness, in 1893, the period was shortened some five or six days, although every precaution appears to have been taken in separating the male, and counting the days from that separation.

In the Domestic Cat the gestation period has been possibly shortened from the increasing powers of fertility, from abundance of food, &c., as stated by Herbert Spencer; and this would appear to be only the case whilst in a state of domesticity, if what Buffon states be true, that the same animal run wild will only produce its young once a year, instead of three or four times; and it may reasonably be supposed that the gestation period has been lengthened and accords with that of the Wild Cat. M. ROULIN remarks that "a restoration of domestic animals to the wild state causes a return towards the original characters of that wild state."



THE FETTERED CAT.
(*Felis maniculata*.)

THE RELATIONSHIP OF *FELIS CATUS*
WITH *FELIS DOMESTICA*.

MANY of the earlier writers on the Wild Cat, as Buffon, Pennant, Bingley, Cuvier, Church, Shaw, Donovan, Stark, and Owen, consider that *Felis catus* is the ancestor of the Domestic Cat of Europe; on the other hand, Temminck, Cretzschmar, Sir W. Jardine, Isidore Geoffroy St.-Hilaire, and others consider that the Egyptian Cat described by Rüppell (*Felis maniculata* *) is the original founder of our Domestic race; whilst Pallas, Blyth, and others believe that the Domestic Cat is the descendant of several species commingled together.

BUFFON ('Histoire Naturelle,' vol. vi. 1756) says:—
"Le Chat sauvage représente la race originaire des Chats domestiques; ils lui ressemblent tous parfaitement par les principaux caractères de la figure extérieure et de la conformation intérieure, et ils n'en diffèrent que par des variétés ou des caractères qui ne sont ni essentiels ni par conséquent propres à constituer une autre espèce." PENNANT ('History of Quadrupeds,' 1781) says:—"This animal (the Wild Cat) does not differ specifically from the Tame Cat, the latter being originally of the same kind but altered in colour and in some other trifling accidents as are common to animals reclaimed from the woods and domesticated."

* Some confusion appears to exist as to the different scientific names of the Egyptian Cats. Gray in Cat. Brit. Mus. gives *Felis caligata* as the Egyptian Cat. Temminck gives *Felis maniculata* or *Felis ganté* as the Gloved Cat, and *Felis caffra* as the Caffer Cat. *Felis maniculata* is considered to be the same as Rüppell's Cat.

CUVIER ('Le Règne Animal,' vol. i. p. 165, 1829) writes:—"Le Chat ordinaire est originaire de nos forêts d'Europe. En domesticité, il varie, comme chacun sait, en couleur, en longueur et en finesse de poil, mais infiniment moins que le chien."

Sir RICHARD OWEN ('British Fossil Mammals') founded his opinion that our household Cat was probably a domesticated variety of the same species which was contemporary with the Spelæan Bear, Hyæna, and Tiger on De Blainville's statement that the first inferior milk-molar tooth of the *F. maniculata* (Rüppell's Cat) has a thick crown and three roots, while the corresponding tooth in our Domestic Cat and the Wild Cat of Europe has a thinner crown and only two roots.

The following is the original text from M. DE BLAINVILLE's 'Ostéographie des Mammifères,' vol. ii. p. 65, *Felis*, c. 1848-50:—"Je dois toutefois faire observer que dans le *F. maniculata*, la première molaire inférieure de lait est pourvue, sans doute à cause de son épaisseur, d'une troisième racine interne médiane qui n'existe pas dans la dent correspondante du Chat d'Europe, sauvage et domestique, ce qui confirme la distinction de ces deux espèces, et par conséquent démontre que notre Chat domestique n'a pas pour souche sauvage le Chat d'Égypte, comme l'a pensé M. Temminck" *.

* Professor MIVART writes:—"I found, when working at my monograph on the Canidæ, so many individual differences in molar teeth that I came to the conclusion that small dental differences formed a very unsatisfactory support for specific distinction. I have had several skulls of Monkeys in my collection with singular though slight differences of dentition."

ISIDORE GEOFFROY ST.-HILAIRE, however, in his 'Histoire Naturelle générale des Règnes Organiques,' 1862, states that De Blainville, after a careful examination of a skull from an ancient Egyptian Cat and also of recent skulls of *Felis maniculata*, agrees with him that Rüppell's Cat is the original of our Domestic Cat.

"Ce Chat," says Isidore Geoffroy St.-Hilaire, "a été découvert à l'état sauvage en Nubie par M. Rüppell; on l'a depuis retrouvé en Abyssinie, où il est à la fois sauvage et domestique. Temminck et le savant collaborateur de M. Rüppell, M. Cretzschmar, l'ont décrit presque simultanément sous le nom de Chat ganté (*Felis maniculata*) en le signalant comme l'espèce primordiale ou le type de nos races domestiques. Cette détermination a été admise et confirmée en France, par Blainville, après l'examen comparatif d'un crâne antique rapporté d'Égypte par Geoffroy St.-Hilaire et de plusieurs crânes récents des Chats ganté, sauvage et domestique."

Sir W. JARDINE ('The Nat. Library,' vol. ii. 1834) believes with Rüppell and others that the *Felis maniculata* is the origin of our Domestic Cat; he says:—"Although our opinion coincides with that of the above-mentioned authorities, and we think that we are indebted to the superstition of the ancient Egyptians for having domesticated the species described by Rüppell; we have no doubt since its introduction to this country, and more particularly to the north of Scotland, there has been occasional crossing with our own native species."

Dr. ALFRED NEHRING ('Verhandlungen der Berliner anthropologischen Gesellschaft,' July 1889) forms the opinion that the Domestic Cat has two progenitors,

one from the south-east of Asia and the other from the north-east of Africa—viz., the Chinese Cat* and the African Cat—and that the present Domestic Cat of Europe derives its origin principally from Africa, and has been in several places, especially in Germany, much crossed with the European Wild Cat. He considers that the taming or domestication of the smaller varieties of the Cat tribe took place principally with those people who led stationary or non-nomadic lives and who occupied themselves in agriculture in its various branches, as it was of vital necessity that their stores of grain &c. should be protected from the attacks of the voracious rodents, and experience taught them that for this the smaller Cats were extremely suitable.

The late Professor ROLLESTON, in a paper on Domestic Cats, ancient and modern, in the 'Journal of Anatomy and Physiology,' vol. ii. 1868, considered that the Domestic Cat was not known to the Greeks and Romans in classical times, and that the White-breasted Marten (*Martes foina*), which is known also as the Beech- or Stone-Marten, was functionally the "Cat" of the ancients; and further on in his paper he states: "Though there is no reason for supposing that the *Felis domesticus* was domesticated in any other country than Egypt before the Christian era, there are many reasons for demurring to the

* Dr. NEHRING considers that it is probable the Domestic Chinese Cat had its origin in the native Wild Cats; probably, he says, in relatively early times they succeeded in domesticating one of the indigenous Wild Cats. "I certainly," he says, "cannot prove this theory, but, looking at the state of civilization in which the Chinese have lived for so many thousand years, I hold it as very probable that they have possessed Domestic Cats for a very long series of years."

statement ordinarily made to the effect that this animal was first spread throughout Europe at the end of the period of the Crusades"; and further, he says, "The upshot of this paper, then, is to show that in classical times the word *γαλῆ* was used by the Greeks to denote the *Mustela martes* and the Ferret, but not the Polecat probably, though probably the Genet; and that in later times, but not till later times, this word was used also for the *Felis domesticus*"*.

ALDROVANDUS, in his description of the Wild Cat, says:—" *Felis* appears to have the same meaning as *Fouinus* in the works of Columella and Varro. These eminent men make no distinction of species between the Cat and the Weasel; their mistake has arisen from two causes—that both Cats and Weasels lie in wait for mice, and that the word *γαλῆ* in the Greek text of Aristotle is sometimes rendered Weasel and sometimes Cat by translators; but we ought to follow Pliny, who translates the *γαλῆ* of Aristotle 'weasel,' and *αἰλουρος* *Felis* or 'cat.' This remark of Pliny's is found in his Hist. Nat. lib. i. c. 4, § 16; he says there are two kinds of Weasels: one living in woods, of different sizes, called by the Greeks *ἰκτις*, its gall is said to be a good remedy for wasp-bites, in other respects a poison; the other, which roams about our houses and carries its young daily from place to place, changes its abode and attacks serpents."

From reliable sources, it would appear that the

* There can be no doubt that animals of the family *Mustelidæ* and of the *Viverridæ* were used by the Greeks and Romans for the purpose of keeping their houses clear of vermin; but there also can be no doubt that the Domestic Cat had been introduced into Europe very much earlier than has been generally supposed.

Egyptian Cat was introduced into Europe as a domestic animal some 300-400 years before the Christian era, although it was not domesticated by the Romans till much later*.

In the ancient city of Tarentum there are certain representations which prove that these early Greek colonists in Italy possessed the Domestic Cat.

FRANÇOIS LE NORMANT in his work, 'La Grande Grèce,' vol. i. p. 97 *et seq.*, states that on one of the coins of that city, of the finest period (500 and 400 B.C.), there is the figure of the well-known Taras riding on a dolphin, and on the reverse is the figure of a young man sitting and holding a bird in his right hand, which a cat standing erect against his leg is endeavouring to seize. On one of the ancient Tarentine vases is a representation of a young girl caressing a cat, and on another is a girl amusing herself by holding a mirror to a cat which she carries in her arms.

Mrs. JANET ROSS ('The Land of Manfred,' 1889)

* Sir JOHN LUBBROCK, "On the Ancient Lake Habitations of Switzerland," Nat. Hist. Review, 1862, states that the bones of Cats have been found amongst the debris deposits in the mud of Lakes Mooseedorf, Wanwyl (Mauensee), and Robenhausen (Pfaffikonsee). These bones are said to be those of the Wild Cat (*Felis catus ferus*), on the authority of M. Rüttimeyer, who, Sir John states, can from the texture and condition of the bones in many cases distinguish the species and even determine whether the bone belongs to a wild or domesticated animal. But it is possible that these bones may be those of a domesticated imported Cat, as, with these animal remains, hatchets have been found made of nephrite, a substance which must have come from Egypt or Asia; the discovery also, in the debris, of the six-rowed barley (*Hordeum hexastichon*), which, according to De Candolle, was the species generally cultivated by the ancient Egyptians, Greeks, and Romans, proves that there must have been communication with those nations and the lake-dwellers of Switzerland.

remarks that the Tarentines have one great claim on our gratitude—they first imported the Domestic Cat, which they no doubt received in their constant intercourse with the East:

LE NORMANT remarks that the Greek writers mention the *Ailuros* (literally a beast carrying its tail like a plume) as a wild animal to be destroyed for the sake of its skin ; but the Cat was only known as a domestic pet in Egypt, where it was seen by Herodotus, who mentions the strange custom of the inhabitants shaving off their eyebrows as a sign of mourning when the house cat died.

The Romans, although they must have known of this Cat early in the first century, do not appear to have adopted it as a domestic animal till about the fourth century A.D. ; but, as stated above, it appears to have spread over Italy long previous to that date, as representations of this animal are to be found in many of the old tombs in Etruria.

At Cervetri (the ancient *Agylla*), in Etruria, there are many architectural and sculptured tombs ; in one of these, which was opened in 1850, called *Grotta dei Rilievi*, discovered by the late Marchese Campana, there is at the bottom of one of the lower pillars a sculptured figure of an unmistakable Egyptian Cat playing with a mouse. At Corneto (the ancient *Tarquini*), in the *Grotta del Triclinio*, a banqueting-scene is represented : “ In front of each couch is an elegant trapeza or four-legged table bearing dishes full of refreshments and beneath which is the representation of a cock, a partridge, and a cat ; in another tomb a cat is represented climbing up a tree ”*.

* Dennis, ‘ *Cities and Cemeteries of Etruria*,’ 3rd ed. p. 319. Murray’s ‘ *Handbook for Rome*,’ 1875, p. 494.

In another, the Letfo funebre, is a tomb on the vault of which is painted a cat with a pigeon over its head. These tombs date from 350 to 200 B.C.

A correspondent from Rome writes:—"I should think there was no doubt whatever that the Etruscans received the Domestic Cat from the Egyptians by means of the Phœnician traders, as in the very earliest and rudest Etruscan tombs in the neighbourhood of Civeta Castellani (the contents of which are now in the museum of Papa Guilio, near Rome) there are unmistakable traces of the Phœnician trade."

The same correspondent writes:—"There is a very curious and unique *bas-relief* in the Capitoline Museum of a lady piping to her cat, which is standing on its hind legs, while just beyond its reach two dead ducks or geese hang on a branch of a tree."

In the Museum of Naples, a correspondent writes, are two mosaics from Pompeii: "one a kitten killing a chicken or pigeon, very like our Domestic Cat of the 19th century, it is nicely marked grey; another is quite a differently drawn creature, much more angular, of a yellow colour with brownish markings: the difference in form may be that the kitten was drawn by a more able artist."

The Rev. W. HOUGHTON, who has paid much attention to the natural history of the ancients, is of opinion that the Domestic Egyptian Cat was introduced into Italy through the Tyrrhine trade with Egypt, and that the early inhabitants of Etruria were acquainted with the "mouse-killing cat."

The earliest written record of the introduction of the Domestic Cat into Britain is somewhere about 936 A.D., when Hoel Da, Prince of South Wales,

enacted severe penalties for the killing of a " Mousing Cat," as the race was then called.

The Romans were probably the original introducers of this Cat, and as the final evacuation of Britain by that nation took place under the Emperor Valentinian, c. 436 A.D., the period of its introduction may certainly be dated some 500 years previous to the Welsh chronicle, and probably even much earlier. At Silchester, the old Roman city of Calleva, destroyed by the South Saxons in 493, osseous remains of Cats have been found, which, from the size and form of the skull, are probably of the Domestic race. In WRIGHT'S 'The Celt, the Roman, and the Saxon,' p. 339, is an account of a Roman villa at Dursley, near Gloucester, in the debris, mixed with the bones of horse, wild boar, rabbit, mice, goats, pigs, and sheep, are also the bones of *cats*, which, from the surroundings, were in all probability those of the Domestic race. In a kiln, in a Roman villa found near Great Chesterton, the jaw-bones and other osseous remains of a cat have been discovered, which appear to be those of the Domestic race. The Cat was certainly domesticated in Italy long before the Christian era, and from its known propensities to wander, especially during the night in the " season " period, it would come in contact with the Wild Cat, which was indigenous all over Europe, and the result would be a mixture of the two races.

INTERBREEDING OF THE TWO RACES.

DARWIN and all the later writers bear testimony to the various races of Wild and Domestic Cats interbreeding with each other, and that this has not interfered with their fertility, which has remained unimpaired in their offspring.

Although it has been long known that the Wild Cat has bred with the Domestic Cat, this was strenuously denied by some writers, who believed that the two were distinct species, and not varieties, and that if by chance they did breed together, the offspring were hybrids and non-fertile.

Professor HUXLEY defines *Hybrids* as crosses between two species, the offspring being, as a rule, *non-fertile*; *Mongrels* as crosses between two races, the offspring being *fertile*.

Professor MIVART, in his work on the Cat, c. xii. p. 391, asks the question, "What is the difference between a species and a variety?" "Now the various breeds of Cats," he says, "such as are enumerated in the first chapter, are called 'varieties,' while a lion and a tiger are not called two 'varieties,' but two 'species.' The term species may have two meanings—one morphological, the other physiological. According to the first of these, it signifies a group of animals which are alike in appearance. If two groups of animals differ markedly in appearance, and if no transitional forms are known which bridge over, as it were, the difference thus existing between them, then such two groups are reckoned as two distinct species according to the first or morphological signification of that term, *i. e.* they are *morphological species*. The second use of the word 'species' is to



THE WILD CAT. (The Mixed Breed.)
(*Felis catus ferus.*)



denote a group of animals which can breed freely amongst themselves, but which, if united with animals of another appearance, will not produce fertile cross-breeds with them; that is to say, they will not produce young which can go on indefinitely producing amongst themselves a race of cross-breeds as freely as either set of parent animals would have gone on reproducing forms like themselves. Creatures which are in this way restricted are physiological species." And in his 'Genesis of Species,' p. 2, he says:—"The word species denotes a peculiar congeries of characters, innate powers and qualities, and a certain nature realized indeed in individuals, but having no separate existence, except ideally, as a thought in some mind."

DARWIN ('On the Origin of Species,' p. 52) says:—"I look at the term species as one arbitrarily given for the sake of convenience to a set of individuals, closely resembling each other, and that it does not essentially differ from the term variety, which is given to less distinct and more fluctuating forms. The term variety, again, in comparison to mere individual differences, is also applied arbitrarily, and for mere convenience' sake."

DARWIN ('Animals and Plants under Domestication,' vol. i. p. 46 *et seq.*) gives numerous instances of Wild Cats of this and other countries interbreeding with the Domestic Cat.

Sir W. JARDINE ('The Naturalist's Library,' vol. ii.) says:—"We have no doubt that since its introduction to this country (that is, the Domestic Cat), and more particularly to the north of Scotland, there has been occasional crossing with our own native species, and that the result of these crosses has been kept

in our houses: we have seen many Cats closely resembling the Wild Cat, and one or two that were very tame, which could scarcely be distinguished from it."

D. G. ELLIOT ('Monograph of the Felidæ') says that the Domestic Cat crosses readily with any or all of the wild species with which they come in contact, and the hybrids are fertile, and these are always met with in countries where Wild and Domestic Cats are found.

The late JOHN EDWARD GRAY ('Cat. Carn. Mamm. in British Museum,' 1869), writing on *Felis catus*, remarks that it is said to breed with the Domestic Cat, and that the skull of the hybrid, as well as the coloration of the fur, is more or less modified by interbreeding.

HARRISON WEIR ('Our Cats,' 1889) states that in 1871 and 1872 a Wild Cat, aged three years, was exhibited at the Crystal Palace Cat Show by the Earl of Hopetoun, also some hybrid kittens, the father of which was a long-haired cat, the mother a sandy by a wild cat out of a long-haired tabby, which proves, if proof were wanting, that such hybrids breed freely either with hybrids, or with the Domestic or the Wild Cat.

EDWARD DONOVAN ('Natural History of British Quadrupeds') states that these animals (Wild Cats) will always associate with the Domestic Cats when the latter stray into the woods in quest of mates, and produce young, which is an obvious proof that they are both from the same parent stock.

ISIDORE GEOFFROY ST.-HILAIRE (Hist. Nat. gén. tom. iii. p. 177 *et seq.*) states that he was informed by M. Gyon, surgeon to the army of Algiers, that

the Domestic Cat had bred with the Wild Cat of that country, and he remarks that in these mixed unions the female was, as a rule, from the Domestic variety:—
 “ Nous n'avons pas chez les mammifères d'exemples authentiques de croisement fécond entre deux animaux sauvages à l'état de liberté, mais nous en connaissons plusieurs entre un animal devenu momentanément libre et un animal sauvage, comme entre le chien et le loup, le chien et le chacal, le chat et plusieurs de ses congénères, le cochon et le sanglier,” &c.

E. LAYARD ('Cat. of the S. African Museum,' 1862) says that the Domestic Cat in South Africa breeds freely with the Wild Cat of that district (*Felis caffra*), and he informed Mr. Darwin that a pair of these hybrids (?) have become perfectly tame and much attached to the lady who brought them up, and Mr. Fry has found that these hybrids are fertile.

In India the various wild species have bred freely with the Domestic variety.

BRIAN HODGSON ('Journal of the Asiatic Society') says:—“The Domestic Cat is as common in Nepal as elsewhere, and has no peculiarity worthy of note: judging from its marks, I should conjecture that it is derived from *F. nipalensis*; if so, it has lost in domestication the fine ground-colour of that beautiful species.”

WALTER ELLIOT (J. As. Soc. xvi. p. 247) also states that *Felis chaus* interbreeds with the Domestic Cat, and the offspring of these has the thick tail and the brown bar inside the forearm characteristic of *F. chaus*; he has often noticed the same marking in the Domestic Cats of India. BLYTH states that the Domestic Cat of the Afghans is very similar to that of the Himalayan districts, running into all sorts of varieties as to colour as they do with us, although

the most general is a dark grey with black spots and stripes; he also says that the Domestic Cats of India are smaller than those of Europe, but are very commonly of a grey colour without markings, except on the limbs and some more or less confluent black dorsal lines, the feet and tail being also black to a greater or less extent. This is a style of colouring never seen in those of Europe (of unmixed breed), and the true tabby common in Europe (meaning the tabby with black ground and broad pale streaks peculiarly disposed) is never seen in India; the grey with black tiger streaks is found in both regions, only that the Indian are of a purer grey than the European; wholly black cats are less common than in England. ELPHINSTONE states that the Cats of the long-haired variety called Borauk are exported in great numbers from Afghanistan, but are not numerous in Persia, where they are seldom or never exported. BLYTH, on the authority of Dr. D. Short, says that at Hansi the common Cat breeds with the *F. ornata* (or *torquata*), and that many of the Domestic Cats of that part of India were undistinguishable from the wild *F. ornata*; and Dr. KELAART states that he has seen hybrids between the Domestic Cat and *F. viverrina*. BLYTH also states that the Angora Cat breeds freely with the Indian Domestic Cats, which have been much crossed with the *F. chaus*. DARWIN remarks that in England half-bred Angora Cats are perfectly fertile with one another; and he observes that "from these several cases we see that in Europe, Asia, Africa, and America, the Common Cat, which lives a freer life than most other domesticated animals, has crossed with various wild species, and that in some instances it has been

sufficiently frequent to affect the character of the breed."

W. T. BLANFORD ('Fauna of British India: Mammalia') states that the Jungle Cat (*Felis chaus*) frequently breeds with the Domestic Cat of India, and some of the latter closely resemble it in colour, although they are considerably smaller; and of *Felis torquata* he remarks:—"Nothing especial is known of its habits, and it is far from improbable that specimens of the present form are merely descendants of tame Cats that have run wild. The converse is, however, equally probable, that this is the aboriginal race from which Indian Domestic Cats, and possibly those of other countries, are derived; and the circumstance that skins from parts of India so distant from each other as Nepal, Rájputána, and Kashmir are precisely similar is in favour of the latter view." He agrees with Jerdon and Blyth that all the various races are varieties of a single species.

PROPENSITY OF THE DOMESTIC RACE TO ASSUME
THE COLOUR OF THE WILD RACE.

It is a well-known fact that our Domestic Cats will often desert their homes and take to a feral life, and that their progeny after one or two generations, whatever may have been the colour of the fur of their parents, invariably put on the grey colour.

A. R. WALLACE, in his work on Natural Selection, p. 40, says: "Domestic varieties of animals when turned wild must return to something like near the type of the original wild stock, or become altogether extinct." In a note on this sentence, he says:—"That is, they will vary, and the variations which tend to adapt them to the wild state, and therefore approximate them to wild animals, will be preserved. Those individuals which do not vary sufficiently will perish."

DARWIN, *l. c.*, considers that domesticated animals which return to a wild state are always exposed to new conditions of life, and agrees with Mr. Wallace, that they have to seek their own food and enter into competition with the native productions, and must undergo some change and have a tendency to revert to the primitive state. Feral Cats (*i. e.* Cats run wild), he says, both in Europe and La Plata, are regularly striped, and grow to an unusual size, but do not differ from the Domestic Cat in any other character. Breeds of Cats, he says, imported into this country soon disappear, as, from their nocturnal and rambling habits, free crossing cannot be prevented.

In New Zealand, where there are none but Domestic Cats which have been imported, DIEFFENBACH ('Travels in New Zealand') relates that the imported Cats, on the breaking up of the tribes, were dispersed in the forests, and had become wild and caused great destruction to many of the native birds; and DARWIN states on the same authority that these Cats had all assumed a streaky grey colour.

"The Domestic Cat," says DARWIN, "has run wild in several countries, and everywhere assumes, as far as can be judged by the short recorded descriptions, a uniform character. Near Maldonado, in La Plata, I shot one which seemed perfectly wild; it was carefully examined by Mr. Waterhouse, who found nothing remarkable in it excepting its great size."

Sir W. JARDINE, 'Natur. Libr.,' art. "Egyptian Cat," p. 243, vol. ii.), says:—"There is perhaps no animal that so soon loses its cultivation and returns apparently to a state completely wild; a trifling neglect of proper feeding or attention will often cause them to depend upon their own resources, and the tasting of some wild or living food will tempt them to seek it again and to leave their civilized home. They then prowl about in the same manner as their *confrères*, crouching among covert and carefully concealing themselves from all publicity. They breed in the woods or thickets, and support themselves upon birds or young animals."

St. JOHN ('Nat. Hist. of Morayshire') states that Domestic Cats of a grey or tabby colour are more inclined to take to the woods and hunt for themselves than those of a different colour. The same author ('Wild Sports of the Highlands') remarks, that what-

ever may have been the colour of the parents, those bred out of them are almost invariably of the beautiful brindled grey colour of the Wild Cat.

In many of the skins of the Wild Cats from different parts of Europe of the present day, as well as in those of the offspring of Domestic Cats run wild, the fur, particularly about the muzzle, underpart of the throat, chest, and abdomen, is much mixed with white hairs; in some, these parts are almost white. This is probably the result of the interbreeding of the two races, as in the fur of both African Wild Cats (*F. chaus* and *F. maniculata*), the original ancestors of our Domestic variety, the muzzle, underparts of the throat and chest have many white hairs, and the fur of the abdomen is almost, if not quite, white.

GESNER ('Hist. Animal.'), describing the Wild Cat of Switzerland, states that between the breast and the neck there is a broad patch of very white hairs; but was he describing an example of the true *Felis sylvestris*? The following sentence appears to show that even in his time the original race had been modified by the imported Domestic variety:—"Sed forte, ut domestici, coloribus variant, ita etiam feri non uno colore reperiuntur, in diversis regionibus præsertim. Quem ego circa finem Septembris apud nos captum consideravi hujusmodi fuit" *.

* In the first edition of the 'Historiæ Animalium,' 1551, the words from *Sed* to *præsertim* are omitted, but appear in the second edition published at Frankfort in 1620, some years after Gesner's death; it was evidently a printer's error, as the latter part of the sentence, which is given in the edition of 1551, could have no meaning without the previous words.

IN tracing the lineal descent of the Wild Cat of Europe, it may be divided into five periods:—

1. The Pleistocene Cats: *Felis catus magna* and *Felis catus minuta* of Schmerling; the Cats of the Prehistoric Period.
2. The Wild Cat, *Felis sylvestris*, previous to the introduction into Europe of the Egyptian Domestic Cat, c. 500 B.C.
3. The Wild Cat, *Felis sylvestris*, after the introduction of the Egyptian Domestic Cat, with occasional interbreeding of the two races: from 500 B.C. to 1200 A.D.
4. The Wild Cat, *Felis catus* (Linn.), when, from the more general distribution of the Domestic race, the interbreeding had become more general: from 13th to 18th century.
5. *Felis catus ferus*, the mixed breed, between the above and the Domestic Cat: the Wild Cat of the present time.*

If the supposition be correct, that *Felis catus magna* of Schmerling is identical with *Felis caffra* of historic times, it is possible that the European Wild Cat and the Egyptian Domestic Cat are derived from one common ancestor.

[As these sheets were passing through the press an interesting article on the Wild Cat of Europe appeared, illustrated with two plates, in the 'Atti della Società Italiana di Scienze Naturali,' vol. xxxv., by Professor GIANCITO MARTORELLI, in which he describes two Wild Cats, one from Sardinia and one from the Tuscan Maremma, differing, he states, so entirely from the Wild Cats of the Alps and the rest of Western Europe that he regards them as a new race, closely allied to the African Cat (*Felis maniculata*), to which he gives the name of *Felis mediterranea*.]

* There is also a feral cat, the offspring of Domestic Cats run wild, often described as Wild Cat.

APPENDIX.

MEASUREMENTS OF THE SKULLS

OF

FELIS CATUS AND FELIS DOMESTICA

IN THE COLLECTION OF THE NATURAL HISTORY DEPARTMENT OF THE BRITISH MUSEUM, COLLEGE OF SURGEONS, THE MUSEUM OF THE COLLEGE OF AGRICULTURE, BERLIN, &c., &c.

BRITISH.

Locality.	Sex.	Basal length of skull.	Breadth over parietals.	Form of cranium.	Form of frontal bones.	Parietal (sagittal) ridge.
Scotland	Male.	mm. 85	mm. 51	Round, bulging.	Broad and flat.	Short, well marked.
"	"	82	48	"	"	Short. "
"	"	80	53	"	"	"
"	"	82·5	51	"	"	"
"	"	88·3	48	Compressed, elongated.	Narrow, concave in centre.	Extended half-way along the sagittal suture.
"	"	78·5	46	Round, compressed.	Narrow, flat.	Short.
"	"	81·5	45·5	Round, bulging.	Broad and flat.	"
"	"	89	48	"	"	"
"	"	82	45·5	"	"	"
"	"	87	52	"	Broad, convex.	Short, thick, strong.
"	"	83·5	50	Round, bulging.	Broad and flat.	"
"	"	84	49·6	"	"	Short.

FOREIGN.

Locality.	Sex.	Basal length of skull.	Breadth over parietals.	Form of cranium.	Form of frontal bones.	Parietal (sagittal) ridge.
EUROPE.						
Hungary	Male.	mm. 88	mm. 44	Compressed, elongated.	Narrow, concave in centre.	Extended as far as coronal suture.
Germany, S.	"	78.5	46	Bulging.	"	Short, well marked.
"	"	79	48	"	Broad, convex.	Short.
Sardinia	"	81	48	"	Broad, flat.	"
Spain	"	85	46	Round.	Narrow, concave.	"
"	"	86.5	47	Compressed.	"	Extended half-way along suture.
Greece	"	76	51			
AFRICA.						
<i>Felis chaus</i>	"	96	56	Elongated, slightly bulging.	Broad, concave in centre.	Extended. 3 examined.
<i>F. maniculata</i> ...	"	77	51	Bulging.	Broad and flat.	Short. 7 examined; all similar.
"	"	81.5	53	"	"	Short.
Mummy Cat ...	"	94	55	Bulging, but elongated.	"	Short, strong.
"	"	84	45	Bulging.	Broad, concave.	Short, slight.

DOMESTIC.

Species.	Sex.	Basal length of skull.	Breadth over parietals.	Form of cranium.	Form of frontal bones.	Parietal (sagittal) ridge.
Domestic Cats .	Male.	mm. 83	mm. 47	Bulging.	Broad and flat.	Very short.
"	"	85	43	"	"	Short.
"	"	83	46.5	"	"	"
"	"	78	47	"	"	"
"	"	74	45	"	"	"
"	"	73	45.5	"	"	"
Hybrid or Mongrel (Scotland)	"	77	48	"	"	Very short.
"	"	77	48	"	"	"

*Measurements of the Skulls of the Wild Cats in the Museum
at Berlin, by Dr. A. NEHRING.*

Locality.	Sex.	Basal length of skull.	Breadth over arch of parietals.	Form of skull, brain-case proper.	Development and length of the inter- parietal (sagittal) ridge.	Age.
		mm.	mm.		mm.	
From Collection of the Duke of Wür- temberg	Male.	77.5	46.25	Round, arched.	Very slight. 14	Adult.
" " " "	"	81	44.25	Longish.	Fair. 14	"
" " " "	"	79.5	47	Round.	Moderate. 13.5	"
District of Saar, Rhine Province, 1890	Female.	76	45	Round and arched.	Fair. 14	Old but small.
Hesse, 1876	Male.	89.5	46.5	Round.	None.	Adult.
Göttingen, Hanover, 1866	Female.	80	46	"	"	"
Saxony, 1863	Male.	91	46.5	Longish.	Very fairly deve- loped. 20	"
Dobrudscha, 1877 ...	"	84.5	45	"	Moderate. 12	"
Meisdorf, in the Harz Mountains, 1887	Female.	79	46	Round and arched.	Moderate. 12.5	"
Meisdorf, in the Harz Mountains, 1890	Male.	85	46.25	Longish.	Moderate. 12.5	Old.
Near Driburg, West- phalia; coll. Dr. Nehring, 1888 ...	"	81.25	46.5	"	Fairly developed. 16	"
Sölling; coll. Dr. Nehring, 1876 ...	"	...	45	"	Well developed. 18	"
Harz; coll. G. Rorig, 1893	"	82	45	Round and arched.	Fair. 14	"
Meisdorf am Harz, 1887	Female.	71	45	Roundish.		
Andernach, Rhine; coll. Dr. Nehring, 1887	Male.	70	43.25	"	Slight. 10	7 months old.
Geseke, Westphalia, 1894	"	82	46	Longish.	Moderate. 13	1 year old.

