

Second General Assembly of I.U.P.N. Dr. Herbert Smith led the British Delegation. We offer him our congratulations upon his election as a Vice-President of the Union.

Fauna Preservation Exhibition.—The preparation of maps by Mr. J. I. Menzies for the proposed Exhibition at Cardiff Museum this year, referred to in *Oryx* No. 1, is progressing. The following are now ready:—

The World. Some extinct species and their past ranges.

Zebras. Past and present ranges of Burchell's, Grevy's, and the Mountain Zebra.

The White Rhinoceros. Past and present ranges.

The Black Rhinoceros. Past and present ranges.

The Great Indian and the Sumatran Rhinoceros. Past and present ranges.

The Javan Rhinoceros (*R. sondaicus*). Past and present ranges.

Festival of Britain.—His Grace the Duke of Bedford has graciously consented to open Woburn Park to the public for a week in conjunction with our Society during the Festival of Britain. The Fauna Preservation Society's Week will be from 28th May to 2nd June. Woburn is famous for its animals especially for its many kinds of deer, including the only herd of Père David's deer.

Admission will be by ticket obtainable at the gate of Woburn Park during that week, adults 2s. 6d., children 1s. On Saturday, 2nd June, it is hoped to run a special bus from London for F.P.S. members. Further details of the week will be sent later to all members of the Society.

THE CAT

By PROFESSOR F. E. ZEUNER

Among the domestic pets kept in the towns of England, the cat probably tops the list so far as numbers go. But unlike other domesticated animals its association with man has been relatively short and, in spite of the mouse-catching propensities of some breeds, domestication was in this case only in part guided by economic considerations.

The domestic cat belongs to the genus *Felis* in the narrowest sense, which has its chief representative in the Wild Cat (*Felis silvestris* Schreber), a species that has become extinct in many

parts of Europe, though it is still found in some parts of Scotland. It belongs to a group of wild cats, often classified as distinct species, with a wide distribution and somewhat different habits. The first of these is the European Wild Cat, the northern forest cat. This form is found from Europe to the Caucasus and Asia Minor and is decidedly adapted to dense vegetation and the climbing of trees. The second member of the group is the Manul (*Felis manul* Pall.), the steppe cat of Central Asia. The third is the Yellow Cat (*Felis constantina* Forst. = *ochreata* Gmel.) which occurs throughout Africa, and extends to Syria and Arabia. A race of this extends into India, where I have seen it roaming about in the dry scrub of Gujarat. In the Himalayas, however, other races occur which rather resemble the European wild cat, being adapted to forest conditions. These three "species" replace one another geographically. Although each may be divided into a number of geographical races, they are hardly more than geographical and ecological subspecies themselves. This is confirmed by the fact that the domestic cat interbreeds with the European Wild Cat. Moreover, Dorothea Bate has shown (*Proc. Zool. Soc.* 1905) that forms transitional between the Yellow Cat and the European Wild Cat exist on Mediterranean islands.

Fossil remains of wild cats are known from a fair number of localities of Pleistocene age (the Ice Age), such as Mosbach and Mauer in Germany, Hundsheim in Austria (all these are lower Pleistocene), Grays on the Thames (middle Pleistocene), Taubach-Ehringsdorf in Germany, Lunel-Viel in France, Kents Cavern in England, the Grotte du Prince at Grimaldi and the Grotte de l'Observatoire at Monaco (both on the Italo-French Riviera), Kesslerloch and Schweizersbild in Switzerland (all these of Upper Pleistocene age). There are many other localities. Some of these fossil remains have been referred to the European Wild Cat, and others, though without serious justification, to the African Yellow Cat or to the Manul.

Whilst the living races of cats are easily distinguished by the colour and length of their hair, it has been found by Stehlin, Pocock, and other workers that one cannot distinguish them with certainty on characters of the skeleton. Extreme individuals may be identifiable, but there is so great an overlap in measurements and the relative proportions of the skull, the teeth, and the bones of the extremities that the majority of specimens cannot be placed with certainty. All the fossil specimens known from Europe are likely to belong to the stock of the European Wild Cat, which perhaps produced various ecological types

according to the environmental conditions prevailing at certain times in certain areas.

The wild cats never played a part in the economy of man of the Old and Middle Stone Ages. Finds made in the lake dwellings of Switzerland (New Stone Age and Bronze Age) and even in the Iron Age lake dwellings of Glastonbury, in Somerset, are now also regarded as belonging to the wild form. In Glastonbury, for instance, where animal remains were identified by Dr. Wilfred Jackson, bones belonging to five cats were found associated with other small wild carnivores like fox, otter, marten, weasel, and pole cat. There is thus no reason to suspect that the cats were domesticated.

Unfortunately it is as difficult to recognize a domesticated cat from its skeletal remains as it is to distinguish the wild races from each other. Domestication is therefore often more easily established by the archæological circumstances of a find than by its osteological investigation. In the Roman town of Silchester, the remains of several cats were found. The investigator, H. Jones, did not rely on skeletal characters when he pronounced these as domesticated. He was merely able to make a negative statement, namely that they showed no characters which suggested them to belong to the wild form. On the positive side, he refers to the footprints of cats observed on tiles from Silchester. "It is certainly more likely that domestic cats should walk across tiles laid out to dry at their place of manufacture, than that wild cats should do so."

Nevertheless, it is possible in certain cases to make fairly definite pronouncements as to the wild or domesticated condition of cats. Although there is a great overlap in all characters, certain extremes are confined to either the wild or the domesticated forms. Externally, tame cats with a colour and pattern of coat resembling the wild form are distinguished by their slightly smaller average size and shorter hair. In fact, it is the long fur and bushy tail which make the wild cat appear so much stouter than the tame one; there are no corresponding differences in the skeleton.

The cat was not domesticated in Egypt in prehistoric times. A fragment of a jaw found in Abydos belongs probably to the wild form. No records appear to be known from the Old Kingdom, whilst from Middle Kingdom times only wild representatives are known with certainty. In the New Kingdom (sixteenth century B.C. onwards), however, the cat appears as a domesticated animal helping to hunt birds and sacred to Bastet or Bubastis, a goddess of the Delta.

It is strange that the cat should have been domesticated at so late a period, since the ancient Egyptians used to tame all manner of animals from Old Kingdom times onwards. It is hard to believe that a people who kept hyenas and monkeys and used the mongoose should have neglected the cat so long. Some archæologists indeed hold that the cat was domesticated in Egypt from the first dynasties onwards (c. 3000 B.C.) but the evidence is ambiguous. Hilzheimer states that there is no evidence of any cats prior to the fifth dynasty. It is conceivable that the Egyptian cat was for a long time an intruder who entered human habitations in search of his usual prey, small rodents, and that it was suffered in the villages because of its usefulness, but without being bred in captivity. The Greeks knew the Egyptian cat, and Herodotus (fifth century B.C.) related the story of an unfortunate Greek who killed a cat on his visit to Egypt.

From this time onwards domestic cats appear to have reached Europe, though not in large numbers. By the beginning of the Christian era it was well known to the Romans and it appears to have been kept fairly frequently. With the Romans it spread to the outer parts of the Empire, including Britain. Remains of Roman cats were found in Silchester as mentioned earlier on, in the Villa at Dursley, and recently at Lullingstone, Kent. The Lullingstone cat perished in a fire during the second century A.D. in a basement room of the house of a wealthy man. Most of its skeleton is preserved and shows characters of domestication both in size of the body and the structure of the skull, jaw, and teeth.

It is virtually certain that whenever the domestic cat was spreading in Europe, it would interbreed with the local race of the wild cat. In this manner, characters of the European wild cat entered into the domestic stock and the wild population became contaminated with some originally African characters brought in by feral cats. Since the eighties of the last century Nehring's view has been widely accepted that the colour of the soles of the hind feet is black in the African and pale in the European wild cat. In this respect, the domestic breeds agree on the whole with the African, but Pocock found that the character is invalidated by the study of large series. The cause is probably to be sought in interbreeding.

In the early Middle Ages the domesticated cat appears to have had a thin time. It emerges with the reputation of being the indispensable pet of all genuine witches, and the black cat became one of the symbols of Satan. Whether this was due to

the nightly, silent, expeditions of feral cats, their weird cries and their eyes shining in the dark, we do not know. In any case, another useful creature with similar habits, the owl, suffered the same fate of unpopularity in medieval times. But there were some who pleaded in defence of the cat. In A.D. 936 Howel Dda, a prince of southern central Wales, issued a law for the protection of the domestic cat.

The last three or four centuries have provided us with a sub-modern supply of mummified cats. Unlike the Egyptian mummies of cats, deliberately prepared and entombed because of their sacred associations, these British cats' mummies found in the walls and under the floor boards of old houses are either the results of accidents or of very utilitarian practices. Specimens like the one recently found in a seventeenth century room of the Tower of London may have perished after having ventured too far into the crevices of a medieval building. But others, holding rats or birds in their mouths, like one from Southwark, are likely to be a prepared group, perhaps intended to function as a kind of rat-scare. If so, they must have been manufactured and probably dried before being placed in the building. The latest instance of a mummified cat which has come to my knowledge is from Dublin, where one was found immured in a house built about 1780.

Little need be said about the outcome of the domestication of the cat. The divergence from the wild type has been very slight, except in characters of the skin. Colour, pattern, and length of the hair are thus the chief features used in the distinction of modern breeds. Of these, the "tabby" is closest to the wild form. Curiously enough, two types of tabbies exist, the striped and the blotched. In the striped tabby, the vertical striation is often dissolved into rows of spots and its pattern is virtually that of the wild cat. The blotched tabby, however, has contorted bands of black arranged on the sides in a spiral or circle. This pattern does not occur in any wild race, nor in any other member of the cat family, and is therefore now believed to have arisen as an ordinary gene mutation. It was this type of cat that was named *Felis catus* by Linnæus. Hence this name applies to the domestic cat only, and the correct Latin name to be used for the European Wild Cat is *Felis silvestris* Schreber.

The other major breeds are known by geographical connotations, but their homelands are not known with certainty. The Abyssinian cat which lacks the pattern and has pronouncedly multi-coloured hair like the wild rabbit, does not come from Abyssinia. It may well have arisen from a wild form resembling

the Sardinian cat, in which the markings are disappearing. The Persians and Angoras, both long-haired, have been regarded as coming from the mountainous districts of the Middle East and as being descended from the Manul, without any scientific evidence being available. The length of the hair in these breeds is a product of selective breeding, and comparable with the similar condition in the Pekinese dog, the Angora goat, the Angora rabbit, and the Angora Guinea pig.

In India, cats have been domesticated for at least two thousand years, and feral Indian cats mingle frequently with the wild form, *Felis constantina ornata* Gray. The custom of keeping domestic cats may have reached India from Egypt by way of Babylonia, where it was known in the second century B.C.

The Siamese cat, with its peculiar colour change from white in the young, to smoky shading in the adult, first appeared in Britain in 1884. It is seriously believed by many to have originated in Siam, but some zoologists regard this as unproven and suggest that it is a comparatively recent mutation of the Indian cat. Some workers believe that it sprang from the Golden Cat (*Profelis temmincki* Vig.), but this is not possible, the latter being a different genus and not at all related to the domestic cat. The skull of a Siamese which I measured with care is in no way different from the skulls of African and European cats. There are two arguments in favour of an Eastern origin. One is that the so-called Himalayan rabbit has the same colouration, the other that the tails of Siamese cats are often abnormal, kinked or shortened. This feature is common among the domestic cats of Burma, Siam, and Malaya.

Finally, the Manx cat deserves to be mentioned. It is ideally completely devoid of a tail, a simple mutation apparently linked with high-leggedness. The Manx thus looks like a lynx in outline. Whether it originated in the Isle of Man is highly doubtful. Short tails are frequently encountered elsewhere, especially in the Far East, and one author has even gone so far as to say that Manx cats are common there and that the European Manx was imported.

Thus, the history of the cat is not satisfactorily known. It is an instructive example, however, of a species which is only in the first stage of domestication, perfectly capable still of becoming feral, and comparatively little altered. Changes are most conspicuous in hair length and colour, also in body size which on the whole is reduced. In the skeleton, domestic feeding has resulted in changes in the lower jaw and the dentition which however are still very plastic, so that the characters are

not at all constant. The skull is beginning to be broader, with a shorter face in a number of individuals. This is a character favoured by fanciers. It is deliberately selected and will therefore become pronounced in the comparatively near future. Shortening of the face is a common feature of domesticated animals, well known in the Bulldog and the Pig, for instance. With the change of food many domestic cats are undergoing at present, from their original diet of live rodents and birds to cooked meals including fish, and to milk and biscuits, the rate of morphological change is likely to increase in the future.

It is common knowledge that, when animals are reduced to the state of domestication, their wild ancestors disappear in a short time. This is illustrated by cattle, goat, horse, camel, and others. The cat is an example of one of the ways in which this process works: constant hybridization contaminates the wild stock the existence of which is, at the same time, regarded as undesirable by man.

In this way our European cat has already lost most of her territory and the Scottish refuge has become its main stronghold. As it is most desirable to preserve this interesting species as a memorial to our sadly reduced wild fauna, it seems to me necessary to consider not merely the protection of a few surviving specimens but also the prevention, so far as this is possible, of interbreeding with domesticated cats.

VARIED NEWS FROM TANGANYIKA

The Serengeti National Park.—The Park boundaries have at last been agreed. For some time it seemed that the whole park was in jeopardy except the Ngorongoro Craters and the adjacent highlands; all the rest it was suggested should be called a "National Reserve" in which settlement by man would be allowed. This proposal, made to include in the Park only those areas to which no one whatever would take exception, spelt its doom. Another proposal, made in order to give the Wasakuma tribe the maximum possible area for expansion in the south-west, was for the boundary of the Park to run from Victoria Nyanza along some sixty miles of the Mbalageti River, and then turn southwards. This would have been equally fatal as it is just this stretch of the river which is essential to the animals in the plains, when they migrate westwards in the dry season. The Mbalageti is by no means a big river in the dry season