

# THE SIAMESE AND ORIENTAL BREEDS

## SIAMESE

### Coat Pattern

The unique feature of the Siamese has always been its coat pattern, with a pale body contrasting dramatically with the pigmented 'points' (the face 'mask', the ears, paws and tail). They are, in fact partial albino animals, not quite at the extreme end of the albino spectrum, which would render them completely white and free of pigment everywhere including the eyes. To express their unique colour distribution they must be homozygous for, that is must possess both of a pair of the unique Siamese genes. If they have only one of these genes (as a kitten born of one Siamese and one non-Siamese parent does) the Siamese coat pattern does not appear. Siamese patterned cats were first imported into this country in the nineteenth century from the Far East, at which time the body and head type of the animals was rather more like that of cats found here, but selective breeding has produced the type now regarded as ideal, but of course has not altered the basic gene controlling the pattern.

### Points Colours and Coat

The original Siamese were all seal points, that is, their points were the rich warm 'seal brown' colour, while the contrasting body was a warm creamy shade. What has changed in the coats over the years is the addition of several new colours to the points. It became evident that there was a recessive colour gene around and occasionally, when a cat inherited one from each parent so as to have a matched pair of these, its points altered to grey, or 'blue' as we now call them, while the body was a cooler shade that is now described as 'glacial'. A different colour gene, also recessive so only evident when a cat inherited a matching pair, made the points a soft 'milk chocolate' shade, while the body was what is described as ivory. Where a cat possessed matched pairs of genes for both chocolate and blue, the points evidenced a pale pinkish grey shade now known as lilac, while the body assumed a pale magnolia tone.

The red gene was later introduced and resulted in animals that had rich red points and off white bodies, while in combination with a pair of blue genes it resulted in the cream points. Presence of the red gene, which is unique in that it happens by chance to be attached to the X chromosome has, of course, also resulted in the appearance of tortoiseshell points in females that possess only one X chromosome that codes for red while the other does not (if both code for red then she is of course a red point). The gene coding for tabby pattern was introduced a few decades ago and the Tabby pointed Siamese are now well established and popular, and the tabby pattern may occur in any of the colours mentioned in these three paragraphs.

Yet more recessive genes have been identified and been selected for in recent years, resulting in subtle variations in the points colours, with cinnamon (modified to fawn in the presence of a pair of the blue genes) and caramel (that appears different in presence of blue or lilac gene pairs, and modifies red to apricot) points, all identified recently.

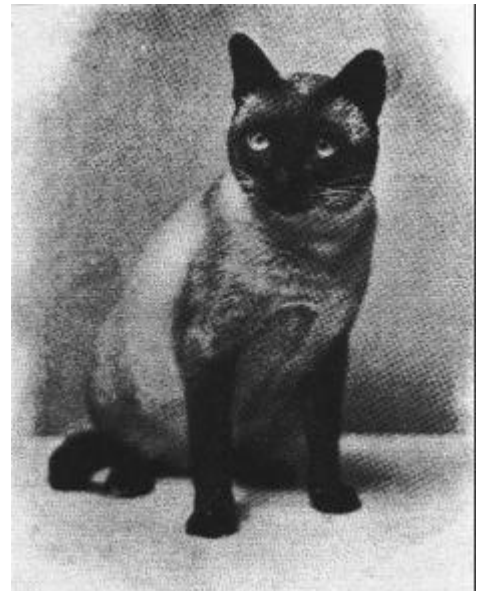
Finally the addition of longer hair, requiring a yet different matched pair of recessive genes, has produced the Balinese cats and these, too, may have any of the colours or patterns found in their Siamese cousins.

The Siamese breed has not hoarded its unique pattern gene to itself but by cross breeding it has donated it to the Persians to produce the lovely Colourpointed Longhairs, to the British to produce British Colourpoints and to the Rex breeds to produce pointed varieties of these.

### Type (or Body Shape)

Now let us turn to the shape, or 'type' of the Siamese. This is controlled by multiple genes quite different from those involved in pattern, colour or coat length and is influenced

significantly by selective breeding. The original Siamese were in type somewhat similar to the cats already found in the West. Selective breeding has developed the type that is described as ideal in the Standard, and this now lies at one extreme end of the range of types found in pedigreed cats. At the opposite end of the type range are the Persians, who have rounded heads, extremely short noses, prominent profile breaks, small upstanding ears, big, round eyes, short, strong legs and bodies and neat short thick tails. In contrast, our Siamese should have heads that are not round, but are relatively long, retaining breadth at the top, ideally an equilateral triangles, pointing downwards to the nose leather, with large, open ears placed on the upper two angles of the triangle and flaring outwards, pointing approximately north-east and north-west as it were. The relatively longer muzzle sometimes may lack depth, or, if the sides are not straight, may throw the cheek bones into undue prominence, creating what is called a 'pinch'. Both these features are undesirable; the muzzle should ideally be 'deep' and strong, while the lines of the wedge from the base of the ear to the nose leather should be perfectly straight or 'even'. Their profiles should be a long straight line with no bump or break, while the eyes should have an almond shape and should be inclined to the horizontal, pointing from the ear bases toward the nose, giving a mysterious, enigmatic, 'oriental' look to contrast with the direct, bold look of the round eyed breeds. The neck and body should be long and elegant, though firmly muscled, and should stand on long slim limbs, the rear legs being slightly longer than the fore ones, with neat paws, while the tail should be long and gracefully tapered, described as a 'whip'. This, for balance, should be of a length that allows the tip to reach the cat's shoulder if brought forward. From the description of the Persian and Oriental/Siamese types, one might almost be describing a different species, rather than different examples of one species, don't you think.



*Early Siamese Type*



*Type Currently Desired for  
Siamese*

## ORIENTALS



In the later decades of last century, some breeders, attracted by the lithe elegant type of the Siamese cats, removed the gene for Siamese colour distribution by selective breeding, producing a whole new breed of animal we now know as the Orientals. These retain the lovely length and elegance of the Siamese type but have no contrasting body pallor. And whereas the Siamese eyes are a striking deep blue, that of the Orientals is green, which at its best is quite stunning. They come in all the colours that Siamese exhibit in their points though the analogue of the Siamese seal appears as deep true black in the Oriental. There is also a white variety with blue eyes (due to a gene that is quite different from the partial albino that codes for Siamese pattern), the Foreign White. There are Tortie and Tabby varieties of Oriental, but the presence of pattern on the body allows us to distinguish between spotted, classic and ticked forms of tabby, not the case with the Siamese in which pattern is confined to the points where these distinctions are not easily made.

### **Oriental genes not seen in Siamese.**

Into the Orientals another genes have been introduced, that are not permitted in the Siamese breed. These restrict the pigment in each hair shaft to varying degrees. One such type produces the 'smokes' that have pigment in a fair proportion of the terminal hair shaft, while another is responsible for the 'shaded' pattern, where the terminal pigmentation is restricted to closer to the tip. Again all the colours and patterns available in the Siamese points may appear in the pigmented areas of these cats' coats. Two further genes expressed in the Orientals but not the Siamese are the Silver gene which turns the background colour of the tabbies and the undercoats of the smokes and shadeds to a bright silvery white that produces striking contrasts, and the gene for patching, quite recently seen in this country, which has produced a stunning new breed in the Oriental section that is starting its progress toward Championship status in GCCF Shows. This patching gene has produced the new Bi-colour Orientals, some of which are very beautiful and whose progress will be interesting to watch.

As in the Siamese, the long hair genes have been introduced to the Oriental breed, producing the Oriental Longhair (originally named the Angora), the Oriental equivalent of the Balinese, currently seen in all the colours and patterns of the Oriental Shorthairs with the exception of the Bi-colour one. No doubt this will soon be introduced.

It is interesting to consider how the enormous number of Siamese and Oriental breeds have evolved or been developed from a relatively small number of seal pointed Siamese imported from the East in the nineteenth century. When you consider the number of pattern variations and then factor in those for colour and hair length, the number of possible variations is impressive indeed. Perhaps you would like to calculate how many are possible.

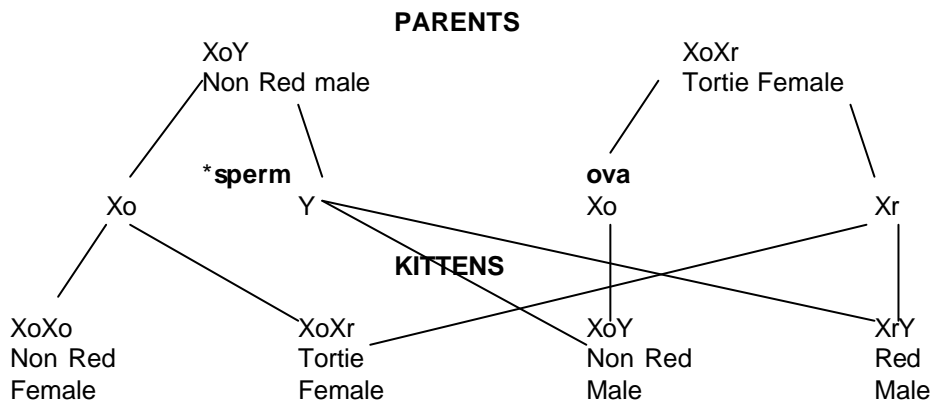
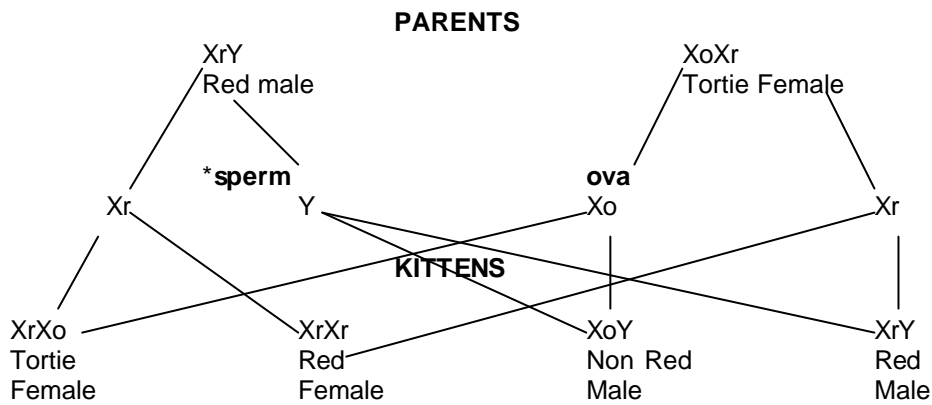
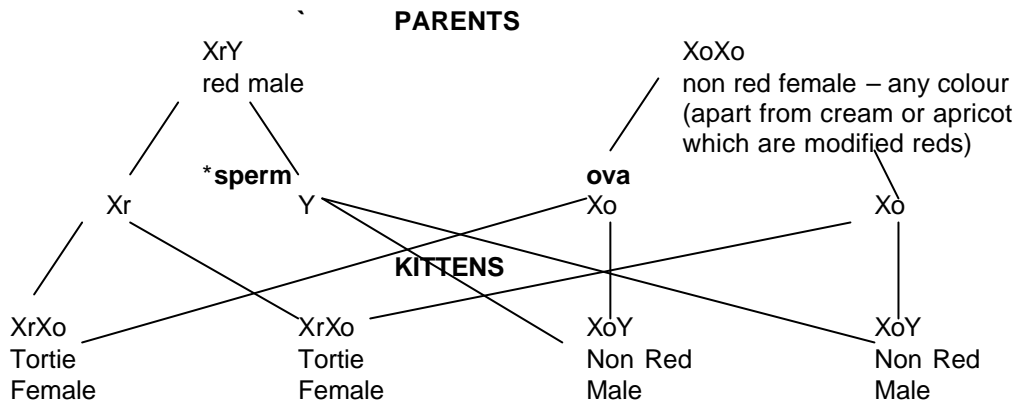


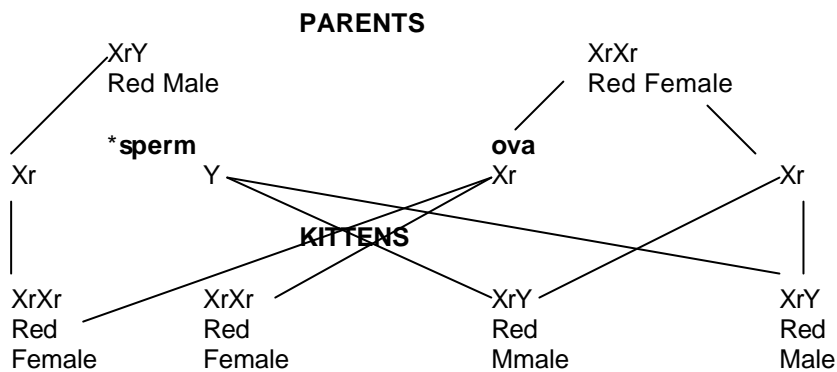
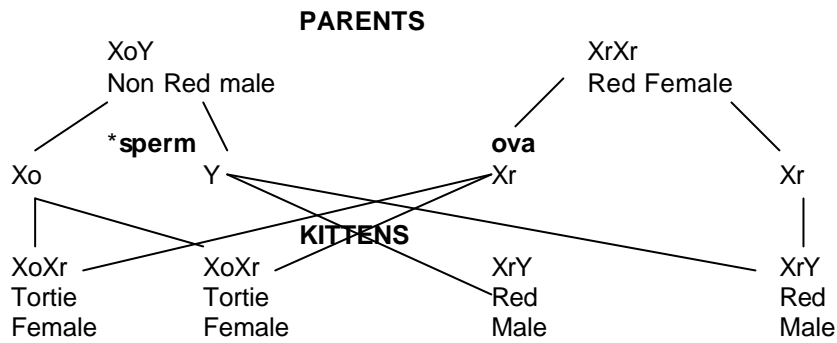
## REDS AND TORTOISESHELLS

A female cat is a female as she possesses a matched pair of the X chromosomes, while, when an X is paired with a Y chromosome, this results in the cat's being a male. Now the X and the Y chromosomes carry not only genes that are concerned with the determination of the gender of the individual, but also other genes that have nothing at all to do with this. The colour gene for red is one of these and it is carried on a unique part of the X chromosome that is not paired by a comparable part of the Y which is significantly shorter than the X. Let's call the X chromosome that carries the gene for redness  $X_r$  while one that doesn't carry one we'll call  $X_o$ . If a male cat's sex chromosomes are  $X_rY$  he will be a red because there is no partner gene on the Y chromosome to modify the  $r$  on his one X chromosome. If a female cat is  $X_rX_r$  she has a pair of red coding genes and will be a red. If, however, she is  $X_rX_o$  she will be a tortie. Why does this happen do you think?

Well it all depends on a curious thing that happens to each pair of X chromosomes in all females. The fertilized ovum starts to divide on its way to becoming a formed foetus, but at some stage of this process, and it may vary a bit from cell to cell, each decides that it can do without one of its X chromosome pair and one is kicked out. Once this happens, all the descendants of the cell retain the same controlling X chromosome. Now this happens at random, so roughly half the cells retain and are dominated by one of the X chromosomes and its genes and half are dominated by the other; and this goes for all their descendants of course till adulthood. Now the product of the red gene is one of the only ones that are easily identifiable by our eyes, without complex laboratory testing, (other than characteristics specifically associated with gender), and we can identify its presence at once. Thus the tortoiseshell appears in the  $X_rX_o$  female where each patch of red on the coat represents cells that have all descended from one cell which has decided long ago to retain the  $X_r$  in charge, while the non red areas are descended from cells that have decided to demote the  $X_r$  and leave the  $X_o$  in charge. Now if the decision about the X chromosome were made at the stage at which there were only 2 cells in the embryo, then the adult cat would be exactly half red and half non red – the 'blaze' line would extend from the tip of the nose to the end of the tail which would look a bit peculiar. However, the time in development at which the decision about the X chromosomes is made is rather later when there are many more cells in the embryo and varies from embryo to embryo. As a result each tortie (or of course, tortie point) cat has a different pattern of red and not red patching.

Here are some the patterns that tell us what the progeny of various types of cats carrying the  $X_r$  gene.





\*Remember that each sperm or ovum (egg) receives only one of every pair of genes from its parent cell, and these then combine with the single one carried by the ovum (egg) it fertilizes to form a new, possibly different pair.

If the blue gene or the caramel gene are added to the mix then anything in the above diagram labelled red, may also be cream or apricot. Blue and caramel genes are not carried on the X chromosome, so these colours are independent of sex and simply reflect a pair of blue or a caramel gene turning up in association with a red one.

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