

DOMINANT BLACK IN CATS AND ITS BEARING ON THE QUESTION OF THE TORTOISESHELL MALES.

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THE existence of two different kinds of black colour in cats was indicated in Tjebbes' experiments on Siamese cats, published in 1924.

A mating reported between Siamese and tabby (wild type) gave 3 blacks. Three other Siamese \times tabby matings, not yet published, have also given black heterozygotes only, together 10 uniformly black-coloured young.

In F_2 from these black cats came 4 blacks, 1 tabby and 2 Siamese. These Siamese are genetically blacks, for from other data Tjebbes has shown, that tabby may be combined with the recessive factor that causes the Siamese pattern.

One of the F_2 Siamese was mated with one of the black F_1 males; the result was 1 black, 1 Siamese, 1 tabby. These matings thus gave together 8 blacks (uniform blacks plus Siamese) against 2 tabbies. No doubt these data are scanty, but when we remember that different factors for black colour, the one dominant over wild type and the other recessive, now have been found in rabbits, dogs and swine, we do not hesitate to contend that in cats also two such factors may be present.

In *rabbits* Punnett in his well-known paper of 1912 proved the existence of dominant black. It is not without interest to mention that this factor was detected in a member of the albino series, viz. the acromelanistic Himalayan rabbit, the nearest parallel to the Siamese cats.

In *dogs* Treschow has published a note on matings between black Norwegian deerhounds, that have given together 23 blacks and 5 wild type colour (grey with banded hairs). These results combined with the fact that wild colour \times wild colour has never given black in the Norwegian deerhound, show clearly that we here have a black that is dominant over wild type. The occurrence of recessive black in dogs is proved by different investigators, recently by Anker in dachshund. The wild type is here completely dominant over the black of the black-and-tans. Further, Wriedt is in possession of unpublished experimental data confirming Anker's conclusions.

With regard to *swine* Nachtsheim has obtained data, so far as we know not yet published, showing that the German breed "Hannoveranisches unveredeltes Landschwein" has a homogeneous black that is dominant over wild type; but in Berkshire pigs the same author has stated that the black colour is recessive to wild type.

The occurrence of this dominant black in cats is of a special interest as it, according to new experiments of Tjebbes, has a bearing on the often discussed tortoiseshell males.

In a new series of experiments with Siamese cats Tjebbes mated a Siamese female with a striped yellow male. This mating has given three young, all tortoiseshell, and two of them were males.

All earlier workers on tortoiseshell cats agree upon the extreme rarity of tortoiseshell males. According to Doncaster only three amongst 225 males from matings black \times yellow, tortoiseshell \times yellow, and tortoiseshell \times black, were tortoiseshell-coloured. Those few males have caused considerable mental exercise to geneticists. It has been a general belief, that tortoiseshell males are infertile and this supposed sterility has caused different authors to put forth hypotheses in order to account for their occurrence (Doncaster, Little, Bonnevie). So it has been supposed, that the tortoiseshell male is either a non-disjunction, or a case parallel to the free-martin in cattle. But Doncaster has mentioned that cat-breeders have had offspring from such males.

In the light of the fact above related, that two tortoiseshell males were produced by a mating of dominant black \times yellow, we think it is more probable that even in the other rare cases known in literature the cooperation of dominant black with yellow is the cause of the exceptionally produced tortoiseshell tom-cats.

As to chromosomes it is of course not yet possible to give a full explanation, but we wish to call attention to Aida's and Winge's results, that genes may be found in the Y-chromosomes of vertebrates. This, and the circumstance that sex-linked inheritance in mammals has been found in only three cases, makes it very probable that sex-linked inheritance is often masked by the lying of genes in the Y-chromosome; also that crossing-over between the X- and the Y-chromosome may take place. Something of this kind may perhaps occur also in our case.

Further experiments on these questions are going on and will be published in process of time.

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