

Sir Christopher Wren may have known from travellers or by converse with foreign men of science of this example, but it is not necessary to jump to that conclusion, as an ordinary brick kiln or oast house would give the idea, aided by Wren's mathematical analysis of cones as units of high carrying power.

Taylor and Cresy's drawings of the Pisan monuments have every appearance of being most trustworthy, and should be consulted by your correspondent. I had the plates with me when visiting Pisa in 1890, and I had the opportunity to go up the tower and round its galleries. Ruskin has a passage on the setting out of the lower part of the western façade of the cathedral, but I remember the impression produced by my examination was not favourable to his argument.

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The Origin of the Domestic "Blotched" Tabby Cat.

THE question of the origin of the two types of our domestic cats has been the subject of much controversy, and it is therefore with diffidence that the views here expressed are now put forward. It is, of course, well known that any domestic "tabby" can, at a glance, be assigned to one of the two colour patterns, "striped" or "blotched."

In a recent paper (Proc. Zool. Soc., 1907, pp. 143-66) Mr. R. I. Pocock comes to the conclusion that the origin of *F. catus* (blotched tabby) is "at present quite unknown," and suggests that it is "the survivor of some extinct, probably Pleistocene, cat of Western Europe" (*ibid.*, p. 160); in effect, he regards *catus* as a good species. It seems to have been pretty clearly shown by the same writer that the *torquata* breed (striped tabby) is either the direct descendant of *F. sylvestris* or is the result of a cross between that species and *F. ocreata* (Proc. Zool. Soc., 1907, p. 947, and NATURE, vol. lxxvii., p. 414), which latter is, no doubt, merely a geographical race of *sylyvestris*.

In his previous paper (Proc. Zool. Soc., 1907, p. 160) Mr. Pocock remarks that "when two distinct species cross the hybrid sometimes reverts in some respects to the characters of a [supposed] common ancestor of both"; this cannot be denied, but such a cross more commonly results in a form intermediate between the two parents, usually designated as a mongrel. After much diligent search, I have been unable to find a single instance in which complete segregation has taken place in respect of all specific characters when two well-defined species are crossed.

The two "types" of tabby, when crossed, always produce individuals which are at once referable to one or the other variety; in short, we get complete (Mendelian) segregation in respect of this character.

It therefore seems to me to be incompatible with the above observed facts, that *F. catus* is the survivor of some extinct cat of Western Europe, for if *catus* were a good species, when crossed with *torquata* we would most certainly have some form of intermediate produced. This, as we know from everyday experience, is contrary to the expressed results of such a cross. From these facts it is suggested as a possible explanation that *F. catus* arose *per saltum* from *F. sylvestris*. In short, I believe that *F. catus* has arisen from *F. sylvestris* as a "sport," and when crossed with its parent species or *inter se* follows the Mendelian law of segregation, as many such discontinuous variations have now been proved to do. At the same time (from evidence which cannot be here brought forward), it would appear that only in extremely rare cases, if at all, can Mendelian action be accountable for the evolution of a species *in nature*.

In opposition to such an origin, Mr. Pocock urges (Proc. Zool. Soc., 1907, p. 160) "the complete absence of evidence that species of *Felis* are ever dimorphic in pattern, and the ascertained fact that they breed true to their specific and sub-specific type." The objection, of course, is a purely negative one, and there is some evidence to show that animals under domestication are more subject to pronounced variation than in a state of nature.

In the leopard (*F. pardus*) we have a species of *felis*

which can most certainly be regarded as dimorphic, in that it produces a black form, and (so far as the somewhat meagre information on the subject goes) in its gametic behaviour is exactly comparable to the case of the "blotched" and "striped" tabby. There are, so far as I know, no data in the case to show which is the "dominant" form, but, from analogy, it is almost certain the black would be dominant over the spotted. It is the hope of obtaining such information in the case of our common cats which has induced me to approach the subject. Finally, it may be said that, although no direct proof can be brought forward in support of such a suggestion, I am convinced that a properly conducted series of experiments with the two types would bring to light much evidence in favour of such a view.

Unfortunately, the writer is at present unable to carry out such a series of experiments, and it is hoped that others may hereby be induced to do so.

H. M. VICKERS.

51A Princes Street, Edinburgh, August 20.

I AM glad Mr. Vickers has directed the attention of Mendelians to the question of our two types of "tabby" cat. With the same purpose in view, and in the hope of inducing someone with time and facilities at his disposal to carry out breeding experiments with these animals, I recently communicated to the Mendel Society a paper on this subject, which will appear in the forthcoming issue of the journal. The results of such experiments are sure to be interesting, but whether or not they will settle the origin of the "blotched" tabby is another matter. They may turn the balance of the evidence in favour of this or that theory, but it is doubtful if they will result in more than a hypothetical conclusion. For myself I have quite an open mind on the point. As stated in my original paper on English cats, the "blotched" tabby may be regarded provisionally either as a survivor of some extinct cat that formerly inhabited Europe or as a "mutation" of the "striped" tabby. I reserved the names "*catus*" and "*torquata*" for these two types as a convenient means of designating them, following Linnæus's method, which is still in vogue, of assigning a specific epithet to our domesticated animals, like *Ovis aries*, *Canis familiaris*, and others, when their origin is uncertain or unknown.

I think Mr. Vickers a little overstates the case when he says there has been much controversy on the subject of the origin of these cats, and speaks of their existence as well known. It was the fact that the remarkable differences between them had been practically ignored or unappreciated by zoologists that induced me to discuss the question at some length three years ago. Nor do I think Mr. Vickers himself quite appreciates the distinction I emphasised between dimorphism in pattern and dimorphism in colour. Experience with wild animals shows that pattern is far more stable than colour. Pattern is wonderfully persistent; colour is not. No one would be greatly surprised at finding a black or white example in a litter of spotted hyænas, but it would be admittedly an extremely remarkable thing if a specimen resembling a striped hyæna in pattern occurred amongst them. Such a "mutation" would be comparable to the "mutation," if mutation it be, of the "blotched" from the "striped" tabby cat. Such a mutation in pattern as that supposed in the case of the hyæna may, of course, be produced to-morrow; but, so far as I am aware, no such variation has as yet been recorded, and I write this with full recollection of the curious variations in pattern that have been recorded of the common leopard.

Finally, may I demur to one more statement made by Mr. Vickers, namely, that animals under domestication are more subject to pronounced variation than those in a state of nature? I do not dispute this common assumption, but I am not satisfied that the evidence in its favour amounts to very much.

The questions raised by Mr. Vickers are, however, full of interest; and all that I have said is in justification of the agnostic attitude that I think should be, for the present, preserved towards the origin of the "blotched" tabby cat.

R. I. POCCOCK.

Zoological Gardens, August 24.