

Albinism and Partial Albinism in Tigers

BY

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(*With a plate*)

By kind permission of the Maharaja of Rewa, I was recently able to visit and photograph the famous white tigers which are in captivity in that former princely State. A white tiger, which had been captured as a cub in the jungles of Rewa, had been mated with a normal-coloured tigress which was its own offspring as the result of a previous litter by an ordinary tigress. This experiment of inbreeding had produced four white cubs which appeared to be identical in coloration with the father, and a striking contrast to the mother.

Before proceeding to give the details of this unique event, it would perhaps be advisable to explain that the terms 'albino' and 'white' are often rather loosely used in reference to light-coloured tigers in India. Varying degrees of 'whiteness' are to be found, from light-coloured specimens with dark brown stripes (sometimes known as 'red' tigers), and cream-coloured ones with dark brown or dark grey stripes, to the Rewa type which have ashy-grey stripes on an almost white background.

Incidentally, when examining tiger skins caution must always be exercised due to the fact that, after lapse of time and exposure to light, all normal-coloured tiger skins fade from their true colour to a cream background with dark brown stripes. Only freshly-cured skins, or those which have been carefully and correctly preserved, can be accepted as giving an accurate picture of what the live animal looked like.

Nearly all the lighter-coloured 'white' tigers which are often described as 'albinos' are only partial albino, for to be a true albino a specimen must have white hair (or feathers in the case of a bird) with no pigmentation, and pink eyes with no pigment in the iris.

As far as I can ascertain, there has only been one case of true albinism in tigers. This was in 1922 in the former state of Cooch Behar in north-east India, reported in a Miscellaneous Note in the *Journal of the Bombay Natural History Society* [28 (4) : 1124] by Victor N. Narayan. He wrote: 'We sent our head Jemadar to

reconnoitre and he came face to face with 4 tigers, 2 of which he reported as being of a very light colour. Three days later we shot 4 tigers out of the same jungle . . . We thought we had bagged all the tigers, but on examination found that two were full-grown cubs, and two about three-quarters grown. The two full-grown cubs, were of the ordinary colour and markings of a tiger, 1 male and 1 female. Measurements about 6'-6". The three-quarters grown cubs, were unique and to me seemed pure albinos. They had pink eyes and were evidently in very bad condition because before being shot at they only trotted along like big dogs, whilst the other two galloped hard. Another peculiarity was the long neck, quite unlike that of any other tiger or leopard I have ever seen; one was a male and one a female. As it was dark we could not beat any more but two days later got the mother, a fine beast in the prime of life and condition. Measurement 8'-9". I forgot to mention the measurement of the freaks viz. 6'-0". Such beasts have never been known of, or seen here, nor during the many shooting excursions my father (the late Maharaja Uripendra of Cooch Behar) made into Assam.'

Whereas there is some doubt as to whether black tigers or white leopards have ever existed, black leopards are commonly found in the wetter regions of south and north-east India and in other parts of south-east Asia. It would be expected that white tigers would be found only in the drier regions, but in fact they are found also in Assam which has a high rainfall with very thick forests, as well as in a large area of central India which is now in the re-organized States of Madhya Pradesh and Bihar. This area includes the Bilaspur and Mandla districts of the old Central Provinces, and old Rewa State, and parts of Bihar.

Cases of white tigers, which have not been true albinos and which appear to have been of varying degrees of creaminess and whiteness, are many. Richard Lydekker in *THE ROYAL NATURAL HISTORY* records that 'a white tiger, in which the fur was of a creamy tint, with the usual stripes faintly visible in certain parts, was exhibited at the old menagerie at Exeter Change about the year 1820'. A record of a white tiger from Poona was published in the *Proceedings of the Zoological Society of London* in 1891.

Messrs. Rowland Ward in their *RECORDS OF BIG GAME* record a number of white tigers shot in India, of which one was shot in Rewa State and presented by the Maharaja to King George V, and is now in the Natural History Museum in South Kensington, London. A male white tiger from the Lechuar Jungles of Bihar is exhibited in the



The white tiger in the courtyard of the palace. A large and fine beast.



The normal-coloured mother with her four white cubs, in a separate courtyard.

Indian Museum, Calcutta, of which the ground colour is cream, stripes light brown, and (glass) eyes normal-coloured.

The Bombay Natural History Society recorded no less than seventeen cases of white tigers shot in India between the years 1907 and 1933. One of these was shot in the Dhenkanal State, Orissa, in 1909 and was described as follows: 'The ground colour was pure white and the stripes were of a deep reddish black colour' [*JBNHS* 19 (3)]. Another was shot in the Bilaspur District of the then C.P. in 1910 and is described in the *Journal* [24 (4)] as 'cream coloured throughout but paler on the head and the stripes were chocolate brown'. Another was shot in the district of Bhagalpur in Bihar, and was described [*JBNHS* 32 (3)] as: 'pure white with black stripes on her body and russet brown ones on the tail. The taxidermists to whom the trophy was sent report that during the year 1926 they received three white tiger skins including mine (mine was shot on December 6, 1926), but my skin is the only pure white one, the other two being cream coloured.' As recently as 1958 a white tiger was shot near Hazaribagh in Bihar, and the skin was on view at a Calcutta taxidermist's.

A number of white tigers have from time to time been reported from Assam. In March 1889 one was shot in upper Assam and is recorded by Lydekker. Lt.-Col. F. T. Pollok in his book *WILD SPORTS OF BURMAH AND ASSAM* published in 1879 wrote: 'Mr. Shadwell, Assistant Commissioner in the Cossyah and Jyntiah Hills, also had two skins quite white, but when turned about in a strong light just a faint mark or two could be seen to indicate that they belonged to a tiger at all . . .'. Boga-bagh Tea Estate in upper Assam is so called from the two white tigers found there at the beginning of this century, and one of them had 'a lemon-coloured patch on the back of the neck, otherwise it was white with faint stripes'. The two light-coloured tigers shot by W. G. Forbes of Hathikuli Tea Estate in 1929 were described at the time of curing by Messrs. Van Ingen as 'red tigers'.

Now back to the Rewa white tigers. There have been eight cases of a white tiger in this old State during the last 50 years, during which time diaries have been kept at the palace. These include a two-year-old male captured near Sohagpur in December 1915 and kept for some years in captivity. H. E. Scott of the Indian Police saw this animal five years later (December 1920) and described it in a Miscellaneous Note in the *Journal* [27 (4)] as follows: '*Body colour*: pure white. No cream colour was visible. *Stripes*: indistinct or light black: while some of the stripes, particularly the face markings, are quite black, the majority are ash-coloured owing to white hairs being

mixed with the black. *Nose*: mottled grey-pink (instead of pure pink as in normal tigers). *Lips*: grey-black on hair line but quickly merge to pink (instead of being quite black and gradually merging to pink well inside the mouth as in normal tigers). *Eyes*: the colourings of the eyes are very indistinct. There is no well-defined division between the yellow of the comex and the blue of the iris. The eyes in some lights are practically colourless, merely showing the black pupil on a light yellow background. *Eyelids*: pinkish-black. *Ears*: practically normal in colour and markings. The ground black is however slightly ashy. *General description*: the tiger is of course underdeveloped owing to years of captivity, but in height he is probably slightly above normal and in a wild state would undoubtedly have been an exceptionally large animal.'

The former Maharaja of Rewa shot a white tigress in 1937. In 1946 a white tigress was shot by the Administrator and when skinned was said to have been found to have six unborn cubs—described as white, but I believe this was not substantiated. The present Maharaja shot a white tiger in 1947—the last one to be shot in this area. At this stage I must record my gratitude to Shri Arimardan Singh, Private Secretary to the Maharaja of Rewa, who not only personally conducted me to see the tigers but also gave me much valuable information about their history and so on.

The white tiger now in captivity in the old disused summer palace at Govindgarh, twelve miles from Rewa town, was captured on May 27, 1951 when it was believed to be about nine months of age. A tigress and four cubs came out in a beat. The mother and three cubs were shot, while the fourth cub which was white and bigger and stronger than the others was later captured in a cage with water placed in it (in a dry place at the dry time of the year). Since then no more reports of a white tiger have been received in the area which used to be Rewa State. On February 27, 1952, a normal-coloured tigress was captured in this area and was kept with the white tiger. Two male normal-coloured cubs were born on September 7, 1953, and of these one was given to Bombay and the other went to a Calcutta dealer.

The second litter of four normal-coloured cubs was born on April 10, 1955, consisting of two males and two females. A male and a female cub of this litter went to a Calcutta dealer, and one male cub was given to the Ahmedabad Zoo—where it still is. A female cub was kept at Rewa (now the mother of the litter of four white cubs). A third litter was born to the white tiger and the normal-coloured tigress on July 10, 1956. Of the four cubs one died on

the first day. Two female cubs were presented to the President and the Prime Minister of India, and went to the Zoological Park in New Delhi. A male cub along with its mother was given to the Ahmedabad Zoo. Ever since then the female cub of the second litter was kept with the white tiger, its father.

On October 30, 1958, the present litter of four white cubs was born, consisting of three females and one male. One cub was weak, but the mother looked after it very well and suckled it first in a corner before feeding the others, and soon this cub became as strong as the others. When I saw the family on April 13 the cubs were said to be fully weaned, and I saw them feeding on pieces of meat. I spent two busy hours in trying to photograph the family, both in colour and in black-and-white, and had little opportunity of closely observing or noting down the exact details of their coloration.

But generally speaking the tiger appeared to be an exceptionally large and powerful beast, with a fine coat and ruff, with ground colour of almost pure white or off-white. There seemed to be no trace of brown, lemon, or even cream colour. The stripes were ash-coloured. The eyes appeared to be icy-blue, and the pads of the paws pink. It behaved in a manner which one would have expected from a typical tiger—it crouched in the shade at the far end of its courtyard and glared at its human visitors as they stood on a safe balcony above. Then it rose, advanced with dignity, and then charged with a shattering roar across the sunlit courtyard. Then it strode back to the furthest shady corner. This demonstration was repeated several times—a spectacular and most impressive sight.

In an adjoining courtyard the normal-coloured tigress and her four white cubs were playing. The cubs appeared to be exact replicas of the father, and therefore need no description. All appeared to be in perfect health, and a striking contrast to their richly-coloured mother. All five animals behaved as would be expected of tame animals in a zoo.

The history of the breeding of these four white cubs poses some interesting problems of genetics. I am personally not competent to express an opinion on this point, but I have found that my Siamese cat when crossed with her own 'tabby-coloured' son (she had mated with a non-Siamese 'tabby-coloured' cat near by produced pure-looking Siamese kittens. Also there is the case of the famous white bull American bison named Big Medicine of the Moiese National Bison Range in the U.S.A.: when crossed back with its own normal-coloured mother, the latter produced a white offspring which was a pure albino with pink eyes and even white hooves.

According to some notes made by me some years ago from a scientific work by Professor J. B. S. Haldane, one of the world's leading geneticists, albino mated with albino produces albinos, while albino crossed with normal almost always produces 'normals' to look at. (I am using inverted commas to distinguish between the different types of normal offspring.) But such a 'normal' crossed with a similar 'normal' would produce $\frac{1}{4}$ albinos and $\frac{3}{4}$ "normals", and "normal" crossed with "normal" would also produce $\frac{1}{4}$ albino and $\frac{3}{4}$ "normals". (Other possibilities of crossing are: 'normal' with normal, "normal" with normal, "normal" with 'normal', and albino with "normal".)

In the case of the Rewa white cubs now under review, this has been the result of crossing an albino (if we use the term loosely: more correctly it is a partial albino) with 'normal'. It would be interesting to see if the same crossing repeated would again produce a complete litter of white cubs, for Professor Haldane in a letter to me recently has expressed the opinion that we are dealing with a 'recessive mutant' and that whiteness being presumed to be a recessive character one would expect equal numbers of white and normal-coloured ("normal") cubs from such a mating between the white tiger and its normal-coloured ('normal') daughter. He considers (provisionally) that the chance of getting a 'run' of four white cubs was $1/16$, like getting four tails running on spinning a coin. More information on the family history of the Rewa white tiger and its various offspring is required before a complete study of the case can be made.

The white tigers of Rewa and adjacent districts appear to have usually been of great size in their wild state, and the present captive Rewa tiger certainly is a large beast. A number of sportsmen and naturalists have from time to time wondered if there existed a separate breed or variety of white tiger in the forests, and whether a wild white tiger would prefer a white mate to a normal-coloured one. Possibly this will never be decided now, owing to the decline in their numbers—no white tigers have been heard of in old Rewa State since 1951.

But now at the Govindgarh palace zoo history appears to have been made, and a distinct breed of white tigers has begun to be established. It should not be difficult now for the white tiger to be again crossed with his normal-coloured ('normal') daughter and more white cubs to be produced; and when the present four white cubs grow up, one hundred per cent white cubs should definitely result

from a crossing between the females and the male, or between the father (also grandfather) and the female cubs.

Caution would have to be exercised against overdoing this kind of inbreeding, although it does seem to take place in the wild state without too much deterioration of stock. The 'normal' and "normal" normal-coloured cubs of the family could also be used in a scientifically planned and properly managed breeding programme.

Such a white breed of tiger, if firmly established in India, would give this country a considerable amount of prestige in the zoological world, as well as provide a fillip for tourism and at a later date a possible economically valuable item of export to foreign countries.

[A few words of explanation may bring out the genetical significance of the case. The white male tiger captured in 1951 genetically carries the double recessive mutant for white (nn). The normal tigress with which it was first mated carried the double dominant for normal colour (NN). The offspring of a cross between nn ♂ × NN ♀ will always be normal-coloured but genetically heterozygous, i.e. will be Nn.

Theoretically a cross between the old white tiger (nn) and a heterozygous normal-coloured female (Nn) may give rise to 50% Nn, normal-coloured heterozygous, and 50% nn, white coloured homozygous. The latter carries factors nn only, and generally speaking any cross between the old white tiger (nn) or any white ♂ descendant and a ♀ white tigress (nn) will only produce white offspring. The white race of tiger may thus become permanently established; however the possibility of a reversion to normal colouring through mutation is not to be discounted.—EDS.]



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