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A CASE OF UNUSUAL INHERITANCE IN MULATTOES

FAE M. SHAWHAN

In October of 1939 I was asked to come to Broadlawn General Hospital in Des Moines to see a child, Pedro, that had recently been born of Mulatto parents. A former student of mine, Dr. Kirby Shiffler, who at that time was a resident interne at the hospital, had become interested in the child because of the unusual number of recessive traits which were obviously present in his phenotypic makeup. With the aid of several of the hospital staff and many different relatives of the child as well as his parents, the information in the accompanying chart was obtained. A summary of this chart follows:

The father of the child is 75% Colored and 25% White, having had a maternal Grandmother that was 100% Irish-White, while the rest of his grandparents were Colored—100%. The father's hair is very dark brown and curly. His eyes very dark brown, and his skin medium to dark. The mother of the child is 62½% Colored, 25% White, and 12½% American Indian. Her hair is dark brown and straight, eyes medium brown, and skin light brown. Her maternal grandfather was 100% White; her maternal grandmother was 50% Colored and 50% American Indian; while her other grandparents were 100% Colored. Her high cheek bones, somewhat narrow chin, and straight, coarse, dark hair give her a definite Indian appearance. The mother of this child has one other male child by a former marriage. This child has dark brown eyes, very dark, kinky hair, and a skin that is much darker than that of the mother. The father of Pedro also has three other children by previous marriages. He says all three of these have characteristics like his own. I have seen one of these and can verify his statement in regard to this one child.

Now as to the characteristics of Pedro. I first saw him at the age of seven days. His skin was white. His hair, very light in general color, had a reddish-golden tinge. It was curly, but definitely not kinky. The eyes very blue, and he had inherited the high cheek bones of his mother. The chart with this paper shows the child to be 68.75% Colored, 25% White, and 6.25% American Indian.

This week I again visited the family. Pedro at the age of eighteen months still has blue eyes, but they have developed a

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Great Maternal Grandfather 100% White	Great Maternal Grandmother 50% Colored 50% Amer. Indian	Great Paternal Grandfather 100% Colored	Great Paternal Grandmother 100% Colored	Great Maternal Grandfather 100% Colored	Great Maternal Grandmother 100% White Irish	Great Paternal Grandfather 100% Col'd Slave	Great Paternal Grandmother 100% Colored Slave
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Hair—Dark Bro'n Eyes—Dark Bro'n Skin—White	Hair—Black Eyes—Dark Brown Skin—Med. Brown	Hair—Black, Curly Eyes—Black Skin—Dark Brown	Hair—Black Eyes—Black Skin—Dark Bro'n	Hair—Black, Curly Eyes—Black Skin—Very Dark Br'n	Hair—Reddish Blonde Eyes—?? Skin—Fair	Hair—Black, Curly Eyes—Black Skin—Dark Br'n	Hair—Black, Curly Eyes—Black Skin—Dark Brown
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MATERNAL GRANDMOTHER

50% White — 25% American Indian
25% Colored
Hair—Black, Straight
Eyes—Light Brown
Skin—Quite Light Brown

MATERNAL GRANDFATHER

100% Colored
Hair—Black, Curly
Eyes—Black
Skin—Dark Brown

PATERNAL GRANDMOTHER

50% White
50% Colored
Hair—Black, Straight
Eyes—Dark Brown
Skin—Rather Light Brown

PATERNAL GRANDFATHER

100% Colored
Hair—Black, Curly
Eyes—Black
Skin—Dark Brown

MOTHER

62.5% Colored — 25.0% White
12.5% Am. Indian

Hair—Dark Brown, Straight
Eyes—Medium Brown
Skin—Very Light Brown

Has one child by former marriage.
Same characteristics as mother, except that hair is kinky.

FIRST CHILD

Sex—Male
68.75% Colored — 25.00% White
6.25% Am. Indian

Hair—Very Light—Reddish Golden Tinge; Curly
Eyes—Blue (7 Days Old)—Blue with Greenish Cast at 18 Months.
Skin—Very Light

MATERNAL AUNTS

1. Eyes—Dark Brown
Hair—Black
Skin—Dark Brown

2. Eyes—Med. Brown
Hair—Black
Skin—Med. Brown

3. Eyes—Med. Brown
Hair—Dark Brown
Skin—Med. Brown

FATHER

75% Colored — 25% White
Hair—Very Dark Brown, Curly
Eyes—Very Dark Brown
Skin—Medium to Dark Brown
Has 3 children by other marriages.
These children have same characteristics as the father.

SECOND CHILD

Sex—Female
68.75% Colored — 25.00% White
6.25% Am. Indian
Hair—Dark Brown, Curly
Eyes—Blue Skin—Medium

PATERNAL AUNTS

1. Hair—Dark Brown
Eyes—Dark Brown
Skin—Dark Brown

2. Hair—Dark Brown
Eyes—Dark Brown
Skin—Light Brown

PATERNAL UNCLÉS

1. Hair—Dark Brown
Eyes—Dark Brown
Skin—Med. Brown

2. Hair—Dark Brown
Eyes—Dark Brown
Skin—Light Brown

2. Hair—Sandy, Red
Eyes—Gray Brown
Skin—Very Light Brown
One child who has light hair, blue eyes, and light brown skin. This child's mother is a light brown negress.

greenish cast. The hair is very light, with a yellowish cast, is very short, and has become so kinky that it is wooly. High cheek bones are still evident in his appearance. It should be noted that the child does not as yet either walk or talk. Pedro now has a sister that is five months old. She has blue eyes, curly to kinky hair, which is dark brown but not black. Her skin color is medium.

The mode of inheritance of eye color, hair color and condition (curly, straight, etc.), and skin color, still appears to be uncertain. Most Investigators agree that skin color is apparently due to at least two pairs of genes. And much evidence has been presented to support the presence of at least three pairs of genes for eye color, three pairs for hair color, and three pairs for shape or condition of hair (straight, curly, kinky).

In this child the particular interest centers around the white skin and blue eyes, and very blond hair, which for some time after birth was wavy and now has become kinky. Apparently we have here the simultaneous manifestation of the nulliplex or double recessive condition of several pairs of genes at the same time. Until we know more about autosome linkage in human inheritance it is impossible to predict the frequency which might be expected for such an occurrence. But if the data on the case have been correctly and accurately supplied, we should be safe in assuming that the occurrence of these characteristics due to so many different pairs of recessive genes should be rare. The mathematical probability of the completely nulliplex condition occurring, disregarding, of course, the possibility of autosome linkage, should be as follows:

- 2 pairs of genes in the genotype—1 chance out of 16
- 3 pairs of genes in the genotype—1 chance out of 64
- 4 pairs of genes in the genotype—1 chance out of 256
- 5 pairs of genes in the genotype—1 chance out of 1024
- 6 pairs of genes in the genotype—1 chance out of 4096
- 7 pairs of genes in the genotype—1 chance out of 16,384
- 8 pairs of genes in the genotype—1 chance out of 65,536

It is impossible for us to be sure how many pairs of genes were involved in the production of all the recessive traits which made their appearance in Pedro's case, but we can be sure there were several. It is not uncommon to see one or two of these traits known to be recessive occur in the offspring of parents, both of whom show the dominant condition in their makeup, but I believe it is unusual to see so many conditions known to be nulliplex appear in one individual child. A blue eyed child from brown eyed Negro parents is not uncommon; light skin appears in the off-

spring of dark skinned parents; occasionally you see a colored person with light hair or with straight hair, or with very high cheek bones; but seldom do you see one, whose parents show the dominants of all these characteristics with the recessives of all of them appearing in one single offspring.

There is nothing startling about the case, of course, and nothing that our laws of heredity cannot explain. It is just that this case provides further evidence that Mendel's Laws apply, just as we expect them to apply, to the human race as well as to *Drosophila* and corn.

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