Crossing Black and White Giants

By Kenneth Rasmussen, Denmark

In 1996 I started breeding with the Black and Blue Giants, but was also on the lookout for some White Giants. I knew that two breeders in Denmark had them at that time and I tried several times to get either some birds or some fertile eggs, but with no luck. The reasons were that the eggs was not fertile or they couldn't spare any adult birds.

In the spring of 1999 one of the breeders called me and said that he had given up improving the Whites due to lack of new blood. And that he was willing to sell the remaining ones to me. This was just before the Easter holidays, so my wife and I took the car the following Saturday and drove the almost 200 miles to visit him and see the white Giants. They were in a rather poor condition, had spent the last 6 months inside and were full of vermin and louse. He had 1 rooster and 7 hens. The rooster and the two hens were so poor in type, that I didn't want them. I decided to take the remaining 5 white hens and then use one of my black roosters as a starting point.

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So how does it work, crossing Black and Whites ?

In order to understand the detailed theory behind this, I would recommend going to the library or on the internet and search for "Gregor Mendel". He was an Austrian monk that experimented with crossing pea plants. The results of his experiments ended up in what we call The laws of Mendel, which is the base for all modern gene manipulation. I will however try to summarize some of the theory here.

Through the selective cross-breeding of common pea plants over many generations, Mendel discovered that certain traits show up in offspring without any blending of parent characteristics. For instance, the pea flowers are either purple or white. Intermediate colors do not appear in the offspring of crossed pea plants.

It is important to realize that, in this experiment, the starting parent plants were **homozygous** for pea color. That is to say, they each had two identical forms (or **alleles**) of the gene for this trait. The plants in the first generation were all **heterozygous**. In other words, they each had inherited two different alleles--one from each parent plant. It becomes clearer when we look at the actual genetic makeup, or **genotype**, of the chicken colors instead of only the **phenotype**, or observable physical characteristics.

All heredity factors (or alleles) are located in what we call the cromozones, which again are located in the core of all cells in the body. Those heredity factors determines the color, bodyshape, behaviour, etc. These cromozones are organized as a pair in the cells and the heredity factors are located at the same spot on both cromozones in the pair. So all heredity factors are present twice in every normal cell. If the two heredity factors in the cell are identical, then we say the heredity is **pure** and will pass the same factors on to all its offspring. But if the two heredity factors are different, then we say it has a **split** heredity and can pass different factors on to its offspring.

Why is this so? It's because prior to the fertilization process, the cells are divided so there is only one chromosome in each of the egg and sperm cells. This means that

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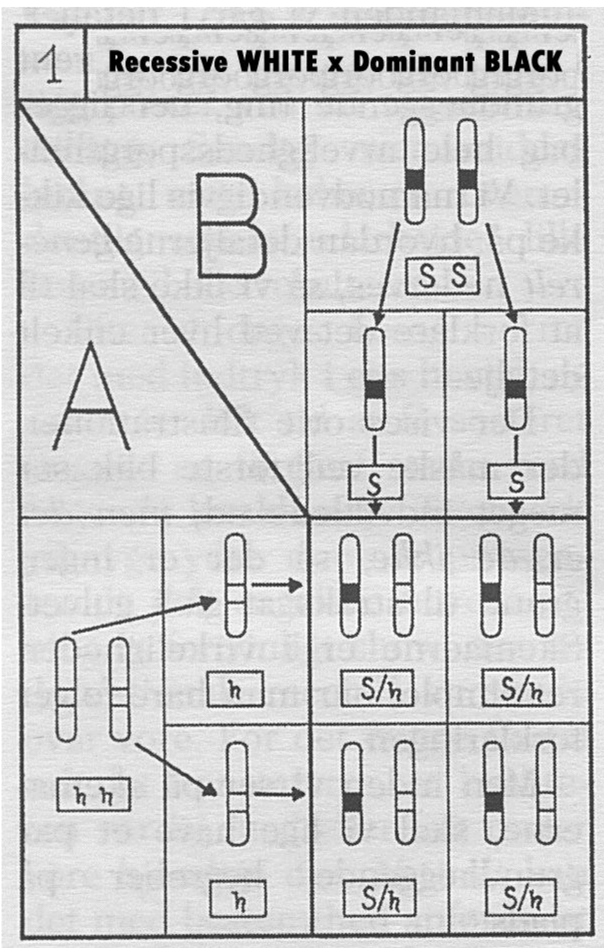
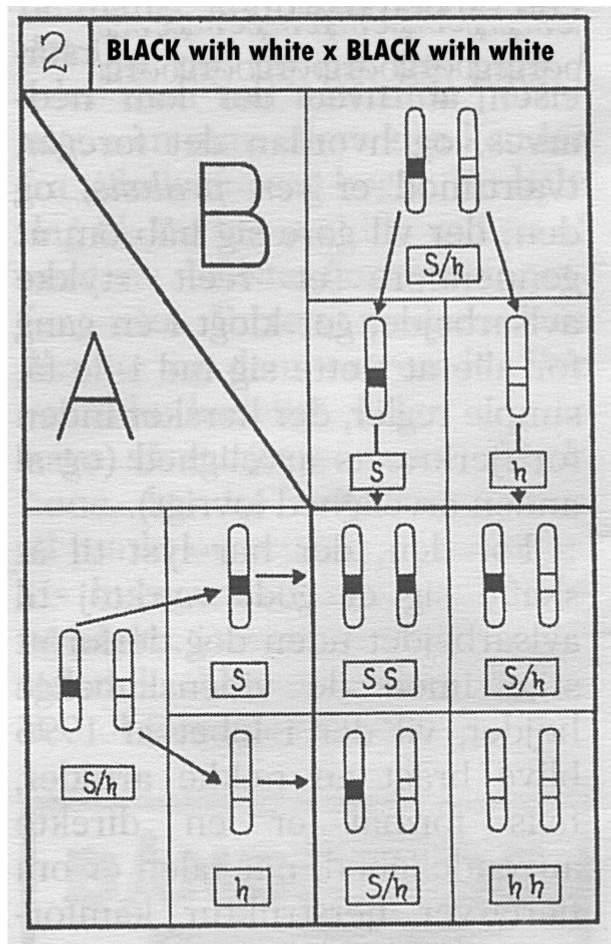
the two heredity factors (chromosomes) from a normal cell are now isolated from each other. During the fertilization process, the single chromosome will melt together with the one from the partner, now forming a new normal cell with a pair of chromosomes. One from each parent. Since we don't know which of the two chromosomes from each of the parent cells that became the egg and sperm cells, then there are 4 possible chromosome combinations in the offspring.



If we look at figure 1, we can see what happens if we cross a recessive White (A) color and a dominant Black (B) color. Both colors are pure, i.e. the chromosomes in the cell are identical. We can see the normal cells with (SS) and (hh) are divided into the egg and sperm cells, now with a single (S) or (h). In all four possible combinations we can see that the new cell will consist of (S/h). All first generation offspring will be Black, but they will all carry a hidden factor for the White color.



Looking at figure 2, we can see what happens if we cross this first generation split Black offspring with each other. The normal cells of both parents now carry (S/h), which means that both the egg and the sperm cell can be either (S) or (h). So

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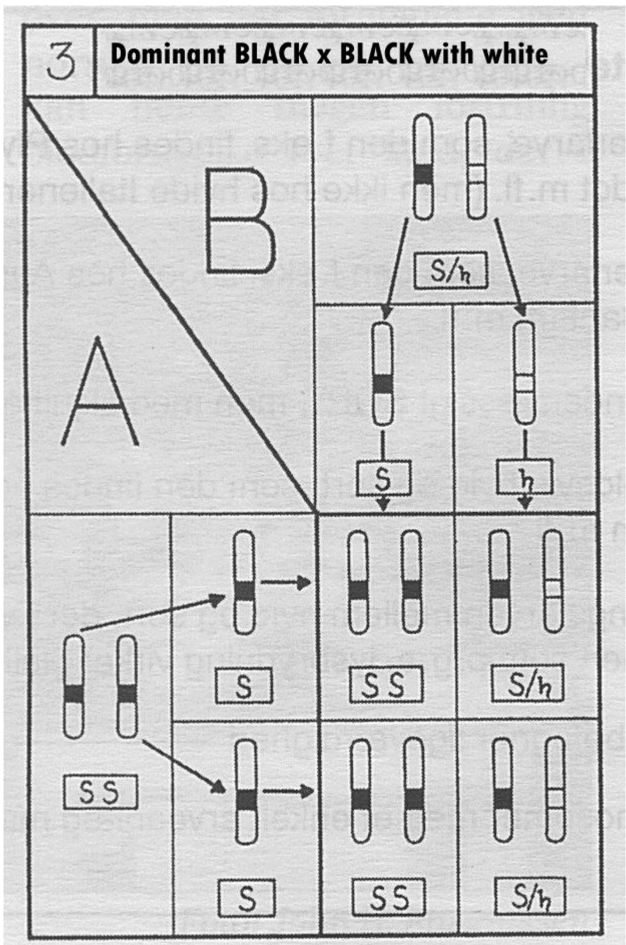
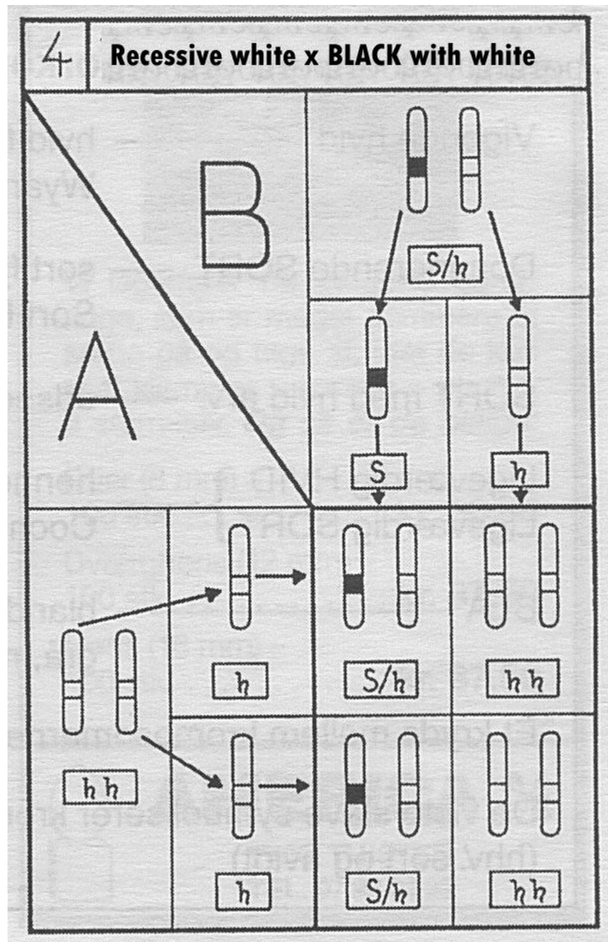
the following statistical values apply for the second generation offspring: 25% will be pure Black (SS), 50% will be Black, but carry a hidden factor for White (S/h) and 25% will be pure White (hh).

Please remember that the percentage values shown here and later is valid only for a large population.



In figure 3, we cross one of our original pure Black (A) with a split Black (B) from the first generation offspring. We can see that all the offspring will be Black. 50% will be pure Black and 50% will be Black, but will all carry a hidden factor for the White color.

At last, in figure 4, we cross one of our original pure White (A) with a split Black (B) from the first generation offspring. We can see that 50% of the offspring will be split Black and 50% will be pure White.



The four illustrations show us the possible combinations there are when crossing a dominant factor with a recessive factor. In this case, a dominant Black color with a recessive White color.

The above is true for the color of Giants and most other heavy breeds. Crossing

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black and whites will only produce either black or white offspring. No blending of colors will occur. When you cross a Black and a White Giant, the first generation offspring will ALL be black. This is because the black color is dominant and the white color is recessive. This is to say, the black color masked the presence of the white color. However, the dominant black allele does not alter the recessive white one in any way. Both alleles will be passed on to the next generation unchanged.

So where the Giants parent generation are **homozygous,** i.e. either pure Black or pure White, the first generation offspring are all **heterozygous**. They are all Black, but do all carry the alleles for the White color as well.

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And how did it go with my crossing of the Black rooster with the White hens? Well, everything with regards to color was exactly as described above. So the Giants I started out with was pure Black and White. All 1st generation offspring was Black as expected and many off them actually had a better greenish shade than the pure Black ones have. So that was a positive sideeffect. Next year I took a Black rooster from the 1st generation offspring and placed him together with the White hens. According to figure 4, that gave me about 50% White chicks. I also placed another rooster and some hens from the 1st generation together, which gave about 25% White chicks. So now after two years, I had both roosters and hens in White. In the following years I did breed both with a pure White line, but was also every year crossing a pure Black rooster with some White hens. By doing this, I was constantly adding more new blood to the Whites. The color of the White Giants was mostly very good on the hens, so was the feather structure. The roosters had more problems, they would often get a yellow/golden shade on their back. Worst case I had a few ones where the feathers on the back were more gray than yellow/golden. They were not used for breeding, but they tasted lovely.

I had a theory that this could be caused by the fact that my pure Black birds had been crossed with the Blue birds. But I'm not sure. I would though recommend to others trying this, that they get a Black rooster from a breeder who is NOT working with Blue Giants.

When it comes to size, I could never make them as big as the Black and Blue ones. Typically the weight was up to a pound less. But I did see improvements in both type, eye and legcolor, shape of the comb and other minor details.

What about the Black ones from the second generation? Are they pure Black or are they Black with hidden alleles for the White color? We don't know. The only way to figure this out is by crossing this second generation Black Giant with a White one. If the offspring of this cross produces just one White chick, then it is not a pure Black Giant. Since the White ones did not have the size or quality of the Black and Blue ones, I newer used those 1st and 2nd generation Giants with the Black and Blue ones. When they had served their purpose of introducing new blood to the White color, they were sold as backyard chickens.

Due to personal reasons, I stopped with the Giants and sold everything 2 years ago. But it was empty without the Giants, so the Black and Blue ones are now back in the pens. And the first baby chicks has arrived.