

The Pigeon Genetics Newsletter

News, Views, and Comments.

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Sandy, Hickory, Chalky and Frosty.

Photos above from left to right a heterozygous Stipper homozygous ash red bar smoky cock (Pomeranian eye crested highflyer by Axel Sell) and next a heterozygous faded ash red bar carrying blue cock(jiennense? Breeder unknown) very good examples showing how similar the two different genotype can be. In the last photo, left a heterozygous faded check and right a dilute blue check showing how similar they can look at this age in certain genetic constellations, again by Axel Sell.

Sandy

Sandy is similar to Stipper but without the strong tendency to flecking. Sandy females are usually lighter in color than the males. Males have a fine flecking on the head and neck with few flecks on the body. They get darker as they get older, but they are slow in the darkening process compared to Stipper. Heterozygous sandy cocks are faster in the darkening process compared

hemizygous sandy hens. Sandy is not semi-lethal as Stipper. However in case of sandy even the het/hemizygous birds occasionally have irregular shaped pupils, although they don't have any trouble in the loft. Homozygous cocks do have visual or neurological issues with a slow head wobble and irregular shaped, typically oval pupils, but they get around the loft and breed well.

The above information about Sandy from Tim Kvidera, who has breeding experience with Sandy, Chalky and Frosty more than a decade. Below we have some photos of the mutant.

Eye view of three Sandy cocks with Oval shaped pupil. First one is of a heterozygous cock and the other two are of homozygous cock. Note the difference in the eye color of heterozygous cock with that of the homozygote – photos from Tim Kvidera.

Left to right a heterozygous sandy het recessive red (young) cock and a

homozygous sandy cock (one year old). Birds bred by Tim Kvidera and the first one photographed by Denny Kuhn.

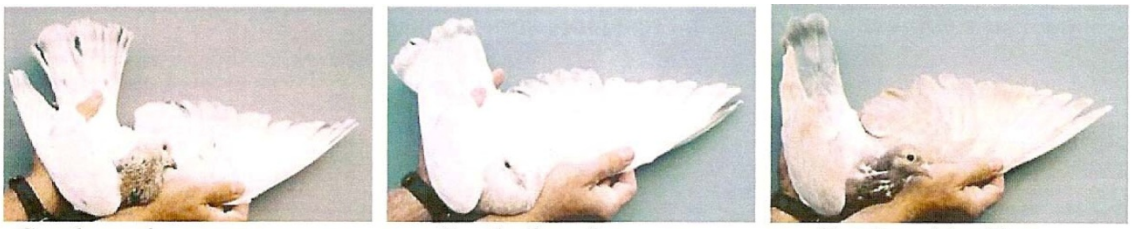
Left to right a homozygous sandy cock(5 years old) and a spread sandy (young) cock bred by Tim Kvidera and the second one photographed by Denny Kuhn.

Left to right a spread hemizygous sandy hen (7 years old) and a spread heterozygous sandy cock (6 years old), bred by Tim Kvidera.

Note the hen is one year older than the cock, although she is the lighter one out of the two.

A 7-8 Years old spread stipper cock for comparison with the above spread sandys. Bred by Kenny Davis.

A heterozygous sandy homozygous recessive red cock, bred by Tim Kvidera.



Sandy male | Sandy female | Sandy with e//e

Photo from an old newsletter.

Sandy from Levi's Encyclopedia of Pigeon Breeds.

Hickory

Information on Hickory and the remaining alleles is very limited. According to Doc Hollander, the lightening effect caused by Hickory is in between faded and Qualmond. Homozygous hickory cocks are usually very light and reported to exhibit abnormalities like eye defects.
In the photos given below of Het/hemi hickory blues, one has a darker tail band whereas the other one does not seem to have a normal dark band. Also the T-pattern one is more like a three year old Stipper cock and the barred one is more like a faded? What makes the big difference!!? Just the pattern or age, gender!?. Since I know there are some senior members in the subscription list who have experience in breeding them I would love to hear about these points from them!

1) Do Hickory birds get darker as they get older like Stipper does?

2) Do they show color difference like het Stipper cocks and hemi Stipper hens do?
3) Down length of homo, het and hemi hickory babies...Please share with us.

Hickory blue T-pattern (Paul G)

Hickory Ashred (Paul G)

Hickory blue bar (Paul G)

Tim Kvidera's Email on August 10th 2015

Bob,

I enjoy receiving your newsletter. Thanks for taking it over. I do have a couple comments to make on the

issue concerning almond alleles. In the table of alleles you mention that I discovered frosty. Yes, I have worked with it for decades, but I did not find it. Fred Genton of Star, Idaho identified it as something new and Bob Nisbett published an article on frosty in the June 1975 issue of the American Racing Pigeon News, pp 14 - 15. As it is essentially a recessive and an allele of almond (St) I have been using stfy as its genetic symbol.

Regarding Mangile's chalky - it is not recessive. It is very similar in expression to faded. Both faded and chalky are readily observable in the heterozygous and hemizygous conditions and reduce pigmentation in the homozygotes to near white. They both are codominants.

Tim.

Chalky

Below we have some photos of Chalky from Tim Kvidera.

Homozygous frosty blue

Heterozygous frosty blue bar

Heterozygous chalky blue check

Heterozygous chalky blue barless

Heterozygous chalky dilute blue bar

Hemizygous chalky dilute blue check

Interesting to note how brownish the dilute chalkys are. We don't have a photo of chalky blue hen; however, they are very similar to heterozygous cocks.
In the depigmentation scale by Hollander, frosty and chalky in the same level but

from Tim's comment and from these examples, I think Chalky should be above Frosty (somewhere in between Faded and Frosty).

Below are few photos of chalky on ash red and brown from old newsletters.

Chalky ash red.

Chalrown T pattern.

Chalky ashred 3rd bar.

Frosty

Frosty is one of the least expressive alleles at the Stipper locus. They are sexually dimorphic; homozygous frosty cocks are somewhat similar to heterozygous faded cocks and as the name indicates with a frosty appearance all over the plumage, hemizygous frosty hens and heterozygous frosty cocks usually don't show the expression so that it is not possible to distinguish/identify them from wild type unless we have the pedigree, so the mutation is considered as recessive to the wild type.

Frosty discovered in the US. Below we have some Photos of Frosty Racing Homers from Tim Kvidera from the US, who has worked the mutation more than a decade.

Homozygous frosty blue bar.

Hemizygous frosty blue bar.

Homozygous frosty blue check.

Hemizygous frosty blue check.

Heterozygous frosty blue bar

Heterozygous frosty blue check

Homozygous frosty blue check

Homozygous frosty spread blue

The homozygous frosty black looks quite similar to some of the Hetero/hemizygous qualmond blacks.

Thüringer Einfarbig (Thüringer Self) is one of the German Thüringer regional pigeon breeds, is well known for its sexual dimorphic coloration due the presence of Frosty mutation. They come in both barred and checker pattern and in both pattern intense and dilutes are present.

A couple of Thüringer Einfarbig (Thüringer Self); left a homozygous frosty blue

bar and right a hemizygous frosty blue bar – Photos from Mick Bassett.

A homozygous frosty blue check cock and a hemizygous frosty blue check hen (Thüringer Self) photos from Galatzer roller.

Dilute homozygous frosty blue bar and Hemizygous dilute frosty blue bar from Galatzer roller.

Dilute homozygous frosty blue check and hemizygous dilute frosty blue check- the above photos are of Thüringer Self from Galatzer roller.

As you can see in the photos, dilute homozygous frosty cocks usually have a yellowish creamy pattern but the dilute hens are similar to silver. The bronze on their belly don't seem to be a separate bronze mutation, but due to frosty. The homozygous frosty homer cock from Tim from the US also has reddish breast. Has anyone studied about it in detail?

Quoted from a post by Axel Sell:

A Thüringer Self (homozygous frosty) barred cock paired with a spread blue hen and their babies a het/hemi frosty blue bar and a het/hemi frosty spread blue.

A hemizygous frosty dilute spread blue (frosty dun) by Axel Sell.

As we saw above, frosty shows sexual dimorphism in combination with spread as well; heterozygous and hemizygous frosty blacks are normal blacks whereas homozygous cocks are relatively lighter as one would expect. The sexual dimorphism could well be happening in combination with recessive red as well when we consider the expression of other alleles at the Stipper locus, however we don't have proof or photos of frosty recessive red to demonstrate that point.

A grizzle T-pattern German trumpeter looks similar to some of the homozygous frosty blue check Thüringer self- photo by Roy Arbeider. And the other one is

from someone from India posted in a group of Indian gola pigeons phenotypically similar to some of the homozygous frosty Thüringer self cocks.

Longseth Lofts Posted in Genetic Pros & Cons, (August 10th 2015)

Question/confirmation here. If I mate an Almond cock,heterozygous for 'blue' to a dp//- hen,the resulting Almond sons will be "Pale Almonds",correct?

Comments:

-  Bob Rodgers Firstly you need to give more information. The Almond is Ash het blue?? Otherwise it is simply a Blue Almond (Intense). The Pale factor is recessive to Intense. Your hen must be pale "something" (base color, Almond /non-almond), etc. I presume that the cock does not carry pale factor??
-  Longseth Lofts OOps. I meant to write HOMOZYGOUS 'blue', cock not carrying pale. IOW,the babies in question would be 'St++//++dp. Hetero St,homozygous "blue", heterozygous pale. 'Pale Almonds'?
-  Jith Peter Normally pale is recessive to the wild type allele intense, so cocks must be homozygous or pale heterozygous dilute in order to express the pale factor. But, some people have claimed that, in case of Stipper cocks that "carries" non allelic mutants like pale, dilute, reduced etc express in the heterozygous state, like brown express on blue stipper when carried on the chromosome opposite to stipper locate. However, we (at least for me) don't have any proof on that and this is something i am really interested in to see some genuine breeding results... hope you will keep us updated.
-  Longseth Lofts Well,OK. So you're saying that if I mate said 'Stipper' cock,homozygous for wild type at the pale/dilute to a pale or dilute hen,then their 'Stipper' sons will NOT be pale or dilute versions of the father. Right?
-  Jith Peter In case of non stipper birds, yes all sons will be intense and they carry dilute or pale that they he inherit from the dam. But according to some people, in case of stipper(the case we are discussing here) the stipper sons will be dilute or pale. That may or may not be true...and I am still waiting to see some examples.
-  Longseth Lofts I have not raised a brazillion such birds,but more than a few Stipper,Faded and Qualmond cocks that are hetero for dilute,enough to not notice a discernable difference. The gist of my question was this: Shoudn't this fact be sufficient to to say that there is more to the ecru/extreme dilute/lemon/whatever color than just saying it's an allele of pale and dilute? If (Blue) Almond cock X "Ecru" hen produces "Ecru Almond" sons, what's going on? Speaking of which.it's been a while since we've heard much from that project. Any updates from anyone?

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-  Jith Peter Well, I have heard this phenomena can happen in case of stipper cocks carrying dilute, qualmond cocks carrying reduced, almond cock carrying ecru/extreme dilute....I don’t know if it always happens or only sometimes, from your comment I have the impression that it does not happen always or yours should have shown expression of recessive alleles. Anyway, I don’t think it can be taken as a proof of allelic relationship...Can you post some photos of your birds that you bred from stipper mated to dilute or pale?
-  Longseth Lofts I asked the original question after looking over some old PGNL's online and found this photo--just wondering...


Young het ecru almond male

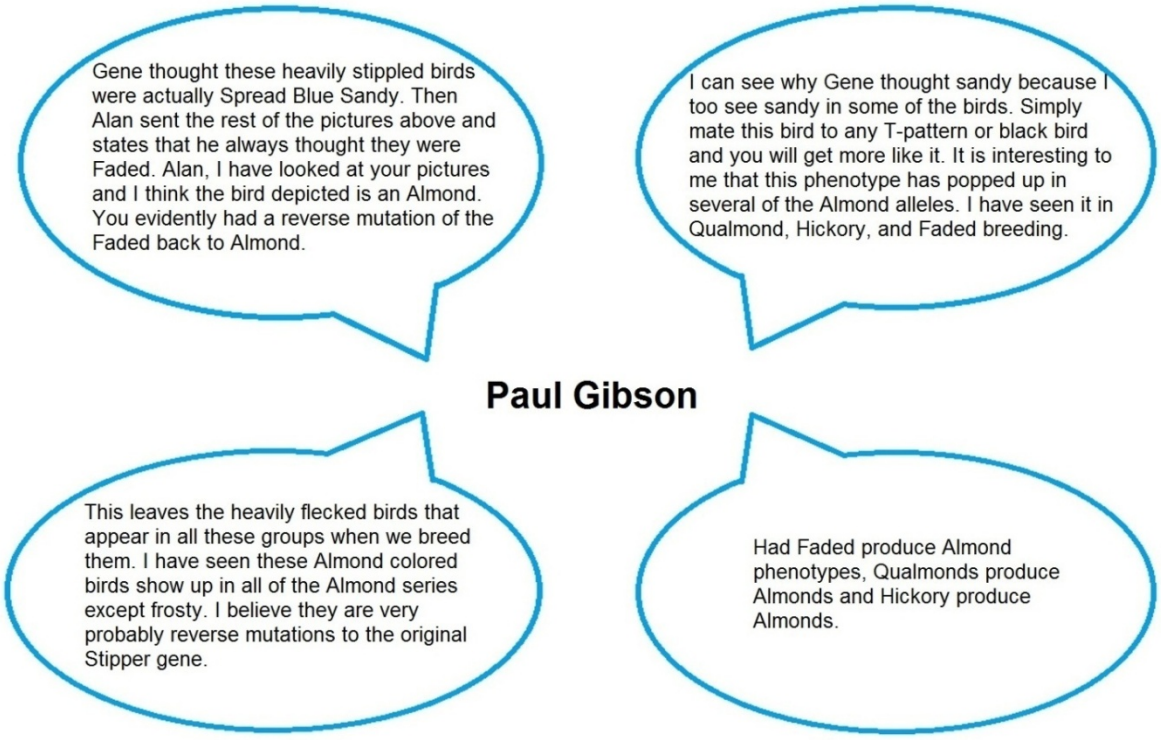
-  Longseth Lofts As for photos of my birds,here's 2. Father and son. Father carried reduced,son did not. Dad first.

-  Longseth Lofts -Son from Brown Ch mom. Really can't see any hint of Reduced in father. I had a lot of Qualmond and Reduced or Dilute mixed together in the past but could never tell just from phenotype.

Instability of Stipper locus

We known that Stipper is one of the most unstable loci in pigeons, we also know that Stipper and some of its alleles such as Hickory& Qualmond show changes in the expression depending upon the age and they are very random in expression. It is probably because of "pseudo reversion" to the wild type in the somatic cells.

The Stipper locus is also known to be unstable in the "germ line", below are a few comments from old newsletters by Paul Gibson made for different posts.



These comments indicate that the Stipper locus might be prone to pseudo reversion in the germ line cells as well. Has anyone test bred such offspring to see if they can produce youngsters like themselves and not like their parents? I suppose, they will, as pseudo reversion happens in merle dogs both in somatic and germ line cells. In germ line I think 2 or 3 offspring out of 100 is the rate and the genetic change is permanent as is expected for germ line mutations.

Lethality of stipper

We know that the Stipper mutation is semi-lethal and homozygous mutant cocks of some of its alleles also exhibit abnormalities like eye and hearing defects. I have seen people commenting that "seems the linkage has broken" when someone posted homozygous Stipper cocks without these abnormalities listed as shown by homozygous mutants. Of course we may tend to think there may be some other variant closely linked to the Stipper locus and that could be responsible for the semi-lethality and such cases are very possible. However, due to some reason, in the case of Stipper I don't believe there is another mutation linked to the Stipper locus causing the lethal problem, instead I strongly believe Stipper only is responsible for the lethal problem. We should consider some facts that are;

1) **Stipper and some of its alleles are highly variable in their expression.**

2) **The defects they can cause correlate to the amount of de-pigmentation they can cause; as we go down the scale, homozygous mutants don't show any abnormalities.**

3) **Genes are not independent in their expression unlike what we deal with in the Mendalian genetics, instead expression of a gene is controlled by many other genes (or the rest of the genome) and they work as a genetic network.**

4) **And a fourth point which we have already given in the July issue that is related to Position effect variegation. (Of course we are not sure yet if PEV is happening in Stipper or that is not what we mean to say by the following explanation). This case may be possible with Stipper birds, but only if PEV has been proven true in them….The point is that, Heterochromatin is normally prevented from spreading into adjacent regions of euchromatin by barrier DNA sequences. Animals, (the fruit fly is an example), that inherit certain chromosomal rearrangements, no longer have this barrier present. So During the early development of such animals, heterochromatin can spread into neighboring chromosomal DNA, proceeding for different distances in different cells. This spreading soon stops, but the established pattern of heterochromatin is subsequently inherited, so that large clones of progeny cells are produced that have the same neighboring genes condensed into heterochromatin and thereby inactivated. <u>There is evidence that during expansion, the condensation of DNA</u>**

<u>into heterochromatin can "skip over" some regions of chromatin, sparing the genes that lie within them from repressive effects.</u>

Premature death of homozygous cocks indicates that expression of the Stipper gene (or whatever is present there) is crucial in the embryonic stage, however, not all homozygous Stipper cocks die in the egg. Why? because that crucial step is happening in some of them. Some of the surviving homozygous cocks can get better vision and hearing as they ages why? They must have overcome (at least partially) from the defects caused by the Stipper mutation. I have also heard that homozygous cocks that are also bald head usually don't show lethal problems or any defects. One of my face book friend bred three Stipper het Qualmond cocks from a spread het Qualmond cock and a Stipper hen, out of them two had dark eyes in the nest and have normal vision, but the third one had enlarged pink eyes. All these indicate that the lethal problem and defects are changeable depending upon the rest of the genome or other variants or whatever. However, if it is possible to make a true breeding strain of Stipper without any defects, remains unanswered… If all these living things on the Earth evolved from a single cell, it may also possible…..never say never, especially when it comes to genetics.

The white baby with enlarged pink eyes in the three photos in the collage is a heterozygous Stipper heterozygous Qualmond bred by Bruce Coons.

Additive genetic effect of Stipper with other mutations

The terminology 'Additive genetic effect' may be new to you, so first I will explain it briefly. Genes may be classified as additive and non-additive genes; additive genes are those genes that code for the same trait and their effects work together on the phenotype, whereas non-additive genes are genes in which there is no summation of the effects of the genes. So, additive genetic effects can be defined as a mechanism of quantitative inheritance such that combined effects of genetic alleles at two or more gene loci are equal to the sum of their individual effects. As I said the terminology may be new to you, however most of us (if not all) are very familiar with it. The best example is pigeon's feather color; we know that there are several genes working together to determine the feather color of pigeons. Example for non-additive patterns are dominance variation and epistatic variation. In the case of dominance variation, a dominant allele expresses and masks the expression of its recessive allele, thus non-additive genetic pattern. We are very familiar with this case in pigeons. Epistasis is another non-additive genetic pattern, involving the interaction of different loci to produce a particular trait in a non-additive way. For example, the epistaic nature of recessive red over the ash red locus, the recessive red locus determines whether the base locus will express or not, if the wild type is present at the recessive red locus, then the base locus will express. If the recessive red locus contains recessive red allele then the expression of the basic pigment locus is near to nil (not zero), thus a non-additive genetic pattern. Additive effects can be positive or negative to depending on the situation.

Neither hetero/hemizygous Stipper nor dilute birds show vision or co-ordination problems. But birds with both Stipper and dilute mutations commonly show vision problems in the nest, especially dilute Stippers with pink eyes, and they usually recover from the problems with age. This is because of the additive effect and in this case the effect is negative. It reminds me of a post by someone in a pigeon genetics group a year ago. Her question was whether dirty has any positive effect and dilute has any negative effect on pigeon's health, my answer was ' probably yes' and it was completely hypothetical, but some people had the opposite opinion and said they never observed any kind of health

problems with their dilute birds. Back then I had no proof to back up with my answer. The negative additive effect of dilute Stipper is very good proof for that. In some cases the slight variations can't be noticeable phenotypically when the mutation is present alone with no other mutations present which otherwise would affect the same trait in the same way, however when two or more mutations are present, which affect a trait negatively, the combined negative effect will be sum of the effect caused by the individual mutations.

Head view of three Hemizygous dilute almond ESFTs (hens) first two by Rob Mast and the last one by Rob Grogan.

The one on extreme left still has pink eyes and the one on extreme right is of a juvenile bird, it was pink eyed in the nest and had slight vision problem. Some intense stippers(het/hemi/homozygous) also show pink eyes in the nest; however, no health issues have been reported with them except the homozygotes. The random nature in the expression of stipper explains why all dilute stippers don't show the problems.

I have also heard that some stipper dominant opals are weaker than normal stippers or opals; anyway the stipper blue check dominant opal below has no issues.

A juvenile stipper blue T-pattern dominant opal with mosaic patch.

Bred by Jijo Thomas.

Last but not least, the naming of the primary mutation responsible for the almond or classic almond coloration is an argumentative topic for a long time. Ignorance is not a solution for anything, and it should be addressed seriously wherever it violates the rules. We have already mentioned in our July issue that in 1925 Wriedt and Christie named the factor "Stipper" and symbolized it as "St" and they are the first to study the mutation and document it. Almond is a phenotype, and the coloration originally came from ESFT and some other breeds, and in ESFT birds with the color is known as almond or classic almond and the genetic formula for the phenotype is for cock: (St//+) ; (B//B) ; (CD//CD) ;(K//K) ; (e//+) and for hen: (St//.) ; (B//.) ; (CD//CD) ; (K//K) ; (e//+). It should be very clear from these formulas given, almond or classic almond is a combination of five different non allelic mutations, among them Stipper is just one, but the most important. So does it make any sense when someone calls the mutation (Stipper)

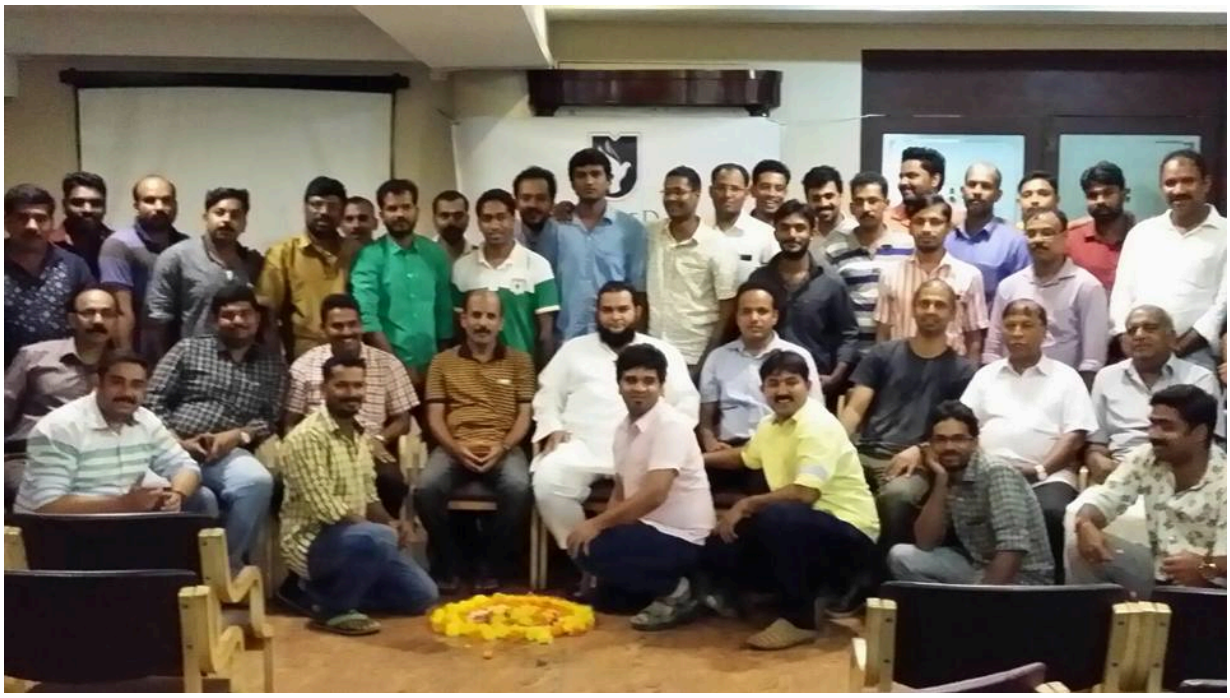
itself almond? No! It does not even match with the symbol given for the mutation. The mutation is also present in Danish tumblers in combination with spread and the phenotype in the breed is known as 'Grey Stipper', not spread almond. No surprise as the phenotype looks nothing like the almond phenotype, In fact the Danish Stippers were created by crossing Danish tumblers with ESFT. We have already started to change this misnaming with our July issue, we should call it Stipper otherwise it would a disrespect to those who first worked and symbolized the mutation. If any of you think, it will be difficult to change what everyone has understood, we could not change the whole world, but we can change ourselves at least…be the change!

A nice faded blue (cock?) with flecks by Axel Sell

Finally a few words about the United pigeon club, it was founded in Kerala about one and half years ago in order to promote fancy pigeons, and the club is still in the initial stage. September 6th was the clubs AGM and I attended the meeting. It was nice to meet many fanciers at one place as I never had the experience before. We had a good number of members in the meeting and many seemed to be excited about the coming show next month as it is the first fancy pigeon show in

India. Mr. Sentil Arasan from Tamilnadu who has more than five decades of experience in fancy pigeon breeding, and is a well known fancier in India, was our special guest at the meeting. From the meeting I heard about an old literature (written in the 15th century) in which they mentioned about 10 to 15 Indian pigeon breeds including the Capuchine that existed even at that time in India. I am very interested in reading the book to see if they have any information about the Lalbands, but so far no luck in getting a copy of it. Nowadays most of our people keep foreign breeds and the native breeds are becoming extinct. I emphasized the need for them to have their own written standards for all the native pigeon breeds, and a few of them seemed to be interested in that, hopefully we will do it in the coming years. I also talked about the genetic newsletters and many of the members seemed to be very much interested in it.

I have added some photos taken at the AGM including (1) a Group photo, (2) a photo of me when I was giving my commentary presentation and (3) a presentation of flowers to our guest Mr. Sentil Arasan.



Qualmond recessive red cock bred by Mike Walter Sr, and a Deroy ESFT, photo from James Mullan.