The Pigeon Genetics Newsletter

Founded by Dr. Willard. F. Hollander

As we know, Bob and Jith are stepping down from producing this newsletter. I personally thought it would be a shame for Dr. Hollander's newsletter to cease altogether, so I thought I'd try to keep it going.

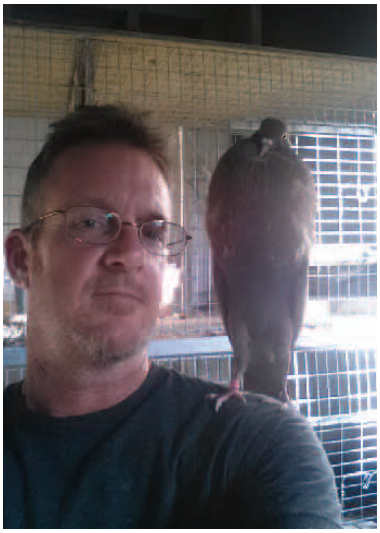
This particular month's issue is mostly just kind of "the reboot", thus allowing me to create a template in my software to build the document faster and editing said template will be easier as I hopefully recieve questions, articles, and suggestions from the group. All the text in here is just me pontificating, kind of just a stream of conciousness thing.

Please don't hesitate to send me any email addresses for anybody who doesn't get the newsletter who would like to check it out and I'll add them to the group.
If anyone has any suggestions about anything in regards to this newsletter as we attempt to keep it circulating let me know.
I want the newsletter to be worthwhile to everyone, or what's the point?

I'd like to aknowledge our appreciation to Bob Rogers and Jith Peter Kerala for keeping the newsletter circulating for as long as they did. I will do my best to produce a monthly newsletter that everybody enjoys and hopefully everybody will feel encouraged to participate as much as possible.

-Ash Hammett

Blue Indigo Dominant Opal Check Horseman Pouter bred by Ash Hammett



Ash Hammett has kept and bred doves and pigeons, chickens and pheasants, finches, and the occasional parrots for forty years. He's also a longtime aquarium fanatic, especially new world cichlids. A veteran of the commercial pet industry, he's seen all the good and all the bad of animal husbandry, from the commercial exploitation of anumals as well as sincere animal lovers. Ash is an animal lover!

The last pages of the this document contain an index of sorts, a list of a bunch of known gene mutations that are documented, noticable, and otherwise observable to us in our breeding programs and breeding standard goals. I am confident in my knowledge of color mutations but I don't know a thing about what ***genetically*** causes rollers to roll, or tumblers to tumble, or how come trumpeters trumpet and laughers laugh.

The index on the last pages is incomplete, of course. It is not totally accurate. I just copied and pasted it from a website; I can't remeber which one. It is, however, ***mostly*** accurate, and a good place to start. I would appreciate any insight our readers may have in improving the index and the names, symbols and short descriptions of any known genetic mutations that aren't listed there. We can expand the index and continue to add to it as we move forward. The goal being to have that index as a credible reference tool we can all have available to us as part of the discussions and articles in our newsletter.

Only known, documented, observable mutant genes ought to be listed in the index. There should be no controversial information in the index. ***Just what we know.***

Perception is everything: How we think of "colors".

The pigments that pigeons are biochemically capable of expressing in their phenotype are Red, Black, and Brown.

Every domestic pigeon is genetically at least one of these "base colors".
More specifically, ***Wild Type*** **Blue**(+), **Ash Red** (BA), or **Brown** (b).
Ash Red is dominant to Blue ***and*** Brown, Blue is dominant to Brown.
These base color loci are located on the sex chromosome, of which cocks posess two while hens only have one. In a male pigeon that carries two different base color genes, the dominant one will be the one that dictates the base color we see.
Since female birds only have one sex chromosome, she cannot carry but one gene for the base color, so whatever gene she carries is the only one she can express in her plumage.
No matter what "colors" we see visually expressed in the pigmentation of the plumage, even if the pigeon is a recessive red or a pink eyed albinio, the bird is **genetically** one of these three base colors on the sex (Z) chromosome(s).

The reason I bring up this most elementary fact about the "colors" we see in domestic pigeons is that the main source for a lot of the confusion we face in discussing color mutations in our hobby is the persistant erronious perception that ***color modifing*** mutations are themselves a "color".
They most definitely are not.

Color modifying **mutations are expressed *in unison* with whatever the base color is.**
All dominant opal, recessive opal, stipper, bronzes, indigo, reduced, rubella, stencils, pieds, grizzles, milky, dilute, pink eyed dilute, and extreme dilute modifiers are seen by our eyes as influenced by whatever **base color gene** expression is visible in the plumage.

For example, it is genetically and biologically impossible for a pigeon to be ***only*** a Dominant Opal.
It will be either Blue, Ash Red, or Brown at the Z base color locus.
The bird will be visually a Blue, Ash Red, or Brown Dominant Opal. It can't be just an Opal. The same is true for Indigo, Reduced, Stipper, Bronzes, Dilutes, etc. etc. etc.

So what about **Recessive Red**, one might ask? Well, Recessive Red is ***epistatic;*** it causes ***any*** pigment produced to be red. All the other color mods ***block*** pigment to various degrees, turning patterns lighter colors, turning bars gold or white, creating the "break" seen in grizzles and stippers, and the white patterns in pied phenotypes, etc.
In the homozygous state, the Recessive Red (e) mutation literally causes only red pigment to be produced in the feathers. It is greatly enhanced by pattern modifiers, particularly heavy check and t-pattern, and darkening mods such as Dirty and Smoky. Even so, the fact is that even Recessive Reds are ***genetically*** one of the three base colors at the color locus on the sex (Z) chromosome. We can't ***see*** the base color, but the code is there, even though all the pigment produced in the feathers is phaomelanin (red) pigment. The point is that whichever of the three base colors is present on the sex chromosome, the pigeon will be a brick red color because the Recessive Red mutation only allows red pigment to be produced.
Recessive White works just like Recessive Red except the Recessive White mutation prevents ***all*** pigmentation from being produced.

So I know I'm repeating myself, and we're always going to be discussing colors of course, but there's a lot more to our pigeons than just a few color mutations.

So if anybody has any thoughts or insights or perspectives they want to share, or just start a discussion about any physical or behavioral trait that makes a breed unique, feel free to write up a piece and get us all interested. It doesn't have to be anything fancy schmancy just to get us going, just an email to me will be fine.
I'll include the email in the newsletters, and we'll all weigh in from there.
A whole article is great, too!

Layne Gardner has agreed to let us have access to some of his photos, as long as we use them exclusively in the newsletter. I know he's got to have some great pictures most of us have never seen, probably many that nobody has ever seen. So I might ask him one month to send us a couple of pictures of this or that breed or color, as is relevant to our monthly topics.

Of course the more pictures everybody sends in the better.

Dutch Cropper bred by Gert H. Sterling, Holland

One color mutation I'd like to hear about from the readership is "Milky".

Milky (my) is a benign, recessive, autosomal genetic mutation that basically turns whatever it is combined with into a "pastel" version of that phenotype. The homing pigeons pictured below are blue check and blue barred pigeons that are homozygous for Milky, commonly reffered to as "Powder Blue".

Three breeds known for the expression of Milky are "Powder Blue" Standard Fantails and Indian Fantails, and "Lavender" Lahores.

Milky is usually seen over the Blue wild type base color, but of course can be bred in Brown and Ash Red as the base color, as well as combined with any other color mutations. I'd love to learn more about what milky looks like combined with other mods.

For example, I've seen photos online of really, really pale, light colored Ash Red looking barred homers that were supposedly not Cherry; it was speculated that they were perhaps Milky Ash Red in the commentary but I don't think it was established one way or the other in that particular thread.

Ash snapped this quick pic of powder blue (milky) homers being sold to a friend.

There's been a whole lot of back and forth about ***Kite Bronze*** in the recent issues.
I could not help noticing that Kite is listed in our index as a single, co-dominant gene mutation. Assuming we all agree that is true, then it becomes pretty easy to analyze all these differing opinions about this particular gene mutation.

"Bronzes" in general are not well understood. Again, we think of what we can ***see*** and not what is coded in the genome.

Brander, Tippler, and **Gimpel** "bronzes" are not the result of a single gene. None of these three "bronzes" can be simply moved out of their ancesstral breeds with a simple first generation outcross? Right? That is because multiple color modifying mutations are present in these breeds that have been refined and selected for decades and maybe even centuries.

Some **Cauchois** pigeons look exactly like **Modena Bronze**, and we know that white-patterned Cauchois are Toy Stencils. Nobody talks about a "Cauchois" bronze? As breeds whose origins are very close geographically (Italy and France) it stands to reason that they would have some old European mutations in common with each other? Is the idea of a "Modena Bronze" the result of an erroneous perception (and subsiquent description) of the actual genetic mutation(s) which to this day plague the hobby with fallacies and "folklore" and pseudo-facts based simply on the names given to the phenotypes these traditional "colors" that older breeds are known for? Indeed, many of the older European breeds contain Toy Stencil in their genomes.

Toy Stencil, as a heterozygote (one copy of the mutation), will produce "bronze" coloration in the pattern areas (coarse spread) on the wing shields, whatever the pattern.
But homozygous (two copies of the mutation) will turn the coarse spread white. Homo toy stencil punches through even the darkest spread to show the underlying pattern as white in adult Toy Stencil breeds. So is Toy Stencil to be considered a "bronze"?
Frill Stencil also will appear very bronzy looking if it's broken up in an outcross.
Is Frill Stencil a "bronze"?

But Toy Stencil alone ***will not*** produce the rich red color in the pattern of a Cauchois or a Modena. So what is going on?

Even more confusing is that I've heard and read and continue to hear the term "Kite" used to describe a specific coloration totally ***out of context*** with a relationship to a ***specific bronze mutation.*** In other words "Kite" has been used traditionally to describe a "color", not to describe a specific mutation and that is why nobody seems to be able to agree on what a "Kite" is.

A hetrozygous Indigo, t-pattern Horseman Pouter. Looks a lot like a "bronze", doesn't he? There is no "bronze" gene in this pigeon's genotype, he just looks "bronze".

Pattern **Indigo** on the Blue base, especially t-pattern, can appear very bronze, though it is definitely not genetically a "bronze".

The only single mutant gene that is documented to create a consistantly demonstrable "bronzing" effect in the plumage both as single or double factor is **Kite Bronze** (K).

Gimpel Bronze is a ***combination*** **phenotype.** I notice our existing index does not list Gimpel Bronze as a single mutant, and it shouldn't, since quality Archangel gimpel is in fact a complex of quite a few color modifiers besides just the gene(s) that cause the unique color modification of the head and breast. Lots of breeders have outcrossed to try and move Gimpel into other breeds with varying degrees of success, but they've all discovered it's not as simple as just moving one gene mutation. It takes at least two modifying genes to achieve the uniform copper coloration over the whole head and breast, and one seems to be recessive on top of that. Gimpel can be bred in any of the base colors and in combination with any other color mutations. Lastly, Gimpel isn't even visually a "bronze" color, it's more like the color of copper, which is what they refer to them as in Germany. Spread affects Gimpel just like it does every other phenotype, it turns the whole pigeon the color of the smooth spread.

Lebanon bronze is another phenotype that many people assume is some sort of breed specific bronze. But the reason Lebanon Bronze looks the way it does is bacause we're seeing that bronze mutation over the Ash Red base. It's as much due to the base color (Ash Red) as whatever particular bronze mutant is involved that determines the Lebanon bronze phenotype.

Grizzle and certain Bronzes also seem to be somehow related. Bronze Tipplers are an amazing metallic reddish bronze color, but if you break it up, you get birds that look like pied grizzles? If it were as simple as moving around a single color mutation, every breed that exists would have had this awesome color moved into it by now?

The point is, "bronze" phenotypes are not what they seem.
Kite Bronze should be one of the simpler ones for us to come to a consensus on.

Interestingly, the only ***single mutant*** in the list of color mutants in the index that has the word "bronze" in its description is Kite (K). Unless we're calling Toy and Frill Stencils bronzers.

There are no ***specifically identified*** single mutant genes for all these "breed specific" bronzes because there ***is not a single mutant gene*** that creates those phenotypes.

Arif Mumtaz's Mumtaztic website offers the most detailed article on Bronzes I have ever seen. I've yet to find anbody's website that is perfect, but I would encourage anyone interested in the Bronzes who has not read the "Bronzes" page on this website to do so.

I'd like to hear from anyone who has some good insight on **Irridescence** in the plumage and how that is inherited and what modifying mutations are known to enhance it.
All domestic pigeons have some irridescence on their neck feathers like wild Rock Doves do.
But what causes it to appear over the whole body like in an Archangel?
Archangel plumage is as dirty and greasy and grunge filled with darkening mods as is possible.
In no other breed will you see a black self as dark and shiny as intense spread Archangel.
It's not just a matter of darkening modifiers, although they sure don't hurt.
Irridescence is at least partially caused by the feather structure; it is ***not*** actual pigmentation.
So what's the deal with irridescence?

In vertebrates, ***craniofacial morphogenesis*** is a process that is the result of genetic mutations.
In normal natural selection this process usually produces ***minimal*** variation. As a result of artificial selection by breeders for hundreds of years, domestic pigeons display ***extreme*** variation in the structure of the front of the skull. Genetic experiments suggest that beak length in pigeons is coded by a small number of genetic factors and mutations.
In crosses between short-beaked breeds and racing homers, a single Z chromosome locus appears to explain a majority of the variation in beak structure.
Research suggests that the ***same locus*** is highly differentiated between breeds with short and medium beaks.

Blue Barred Exhibition Homer ***photo by Layne Gardner***

There are some really good websites that some very experienced and credible pigeon breeders have built over the years. The incredible amount of time it would have taken to build these websites cannot be overstated. The majority of these websites haven't been updated in a decade or more, but even so remain extremely useful to anyone who wants to delve into the study and practical application of genetic inheritance factors in the domestic pigeon.

None of these websites created by pigeon breeders are perfectly 100% undesputably accurate, but they all have some valuable insight and all contain more information and detail than could ever be included in one issue of these newsletters.

There are a few acredited, actual peer reviewed academic studies that have been undertaken involving pigeons, and these studies also have websites available to anyone who wants to learn about pigeon genetics in particular, or just genetics in general.

I bring this up because I am not sure how relevant a newsletter such as this still is?

Obviously when Hollander began circulating a pigeon genetics newsletter it was all new stuff to just about anybody who read it, and Hollander's work is invaluable to everybody who's come after him and then built upon that foundation.

Unless this newsletter is credible (as accurate and up to date as possible,
and built on reliable and objective data as contributeded by knowledgable and experiended pigeon breeders) it is an utterly pointless venture to continue.

ac - achondroplasia (lethal)
al - albino
am - amputated
at - ataxic
b - brown
BA - ash-red
Bh - baldhead pied
c - barless
CL - light checker
C - checker
CD - dark checker
CT - T-patterm
ca - cataract
cl - clumsy
cr - crest
cy - crazy
d - dilute
dp - pale
ds - Davis syndrome
dsc - deutsch scraggly
e - recessive red
er - erratic
F - frayed
fb - feed-blind

fg - fringe
fr - frillneck
fs - Frill stencil (a complex, not a single mutant)
fz - frizzy
G - grizzle
GT - tiger-grizzle
gr - grouse
ic - ice
In - indigo
K - kite bronze
L - silky
ma - mahogany
mi - microphthalmia
my - milky
n - no oil gland
o - recessive opal
oD - dominant opal (99.9% lethal as homozygote)
p - porcupine (homo silky?)
pd - pink-eyed-dilute
py - polydactyly
r - reduced
ro - rolling, tumbling

ros - rose, beak crest
S - spread
Sb - sideburns
sc - scraggly
skpy - Show-King polydactyly
sl - slipper
so - sooty
St - stipper
StF - faded
StQ - qualmond
sy - smoky
t - extra outer toes
tH - Hasz' lethal
tr - pearl iris
Ts - Toy stencil
V - dirty
w - outer-toe web
wo - wobbly
wl - web-lethal
zwh - self white (recessive white)
z - gazzi
zpc - penciled