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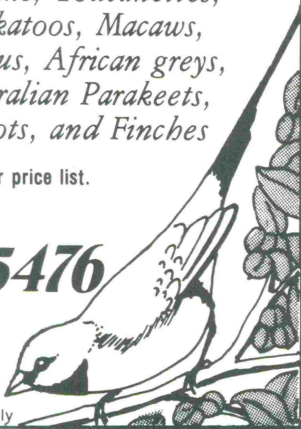
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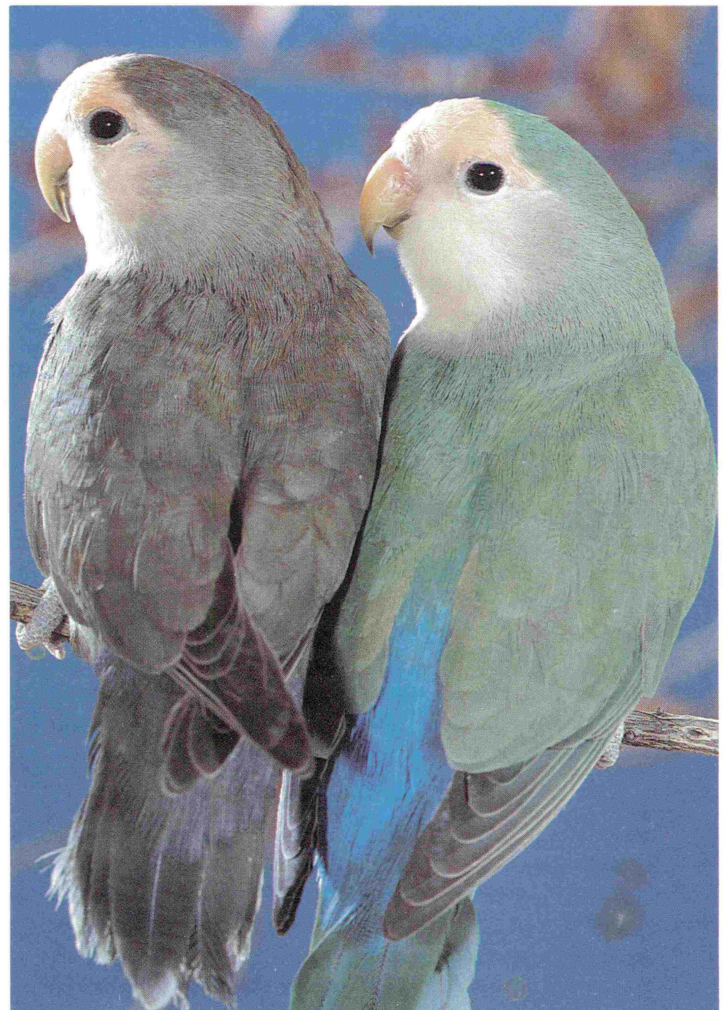
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mutation of
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lovebird.*



*Dark Blue
on left,
Blue, right*

Photos by Dale R. Thompson and George D. Dodge

Peach-faced Lovebirds and Their Colour Mutations

by Jim Hayward
Carterton Breeding Aviaries,
Oxfordshire, England

INTRODUCTION

When I was approached by Tim Dahle with the request to present papers at this Convention, my suggestion for one topic was 'Peach-faced Lovebirds and their Colour Mutations' - thinking that here was a subject in which I was well versed and had already written about extensively. With this in mind I thought it would be very easy for me to encompass the whole topic within the time allotted. How wrong I was. The amount of material I had already written should have been the very evidence with which to demonstrate to myself the width, breadth and depth of proportions which colour peach-faceds now filled. There would be no chance to cover the whole of the subject and it would be very easy to become bogged down with intricacies which could shroud the very essence of the topic. I decided that it was this "essence" which I must try to impart.

Colour in our lives is a great source of aesthetic enjoyment - even more so when it is reflected in the raiments of vibrant living creatures. For a number of people this enjoyment of colour pertaining to peach-faceds is marred, because for them it is enveloped in mystery. I would like to try to dispel this mystery and replace it with an imagination, a realisation that you don't need to be an advanced student of genetics, a code breaker, nor possess a degree in mathematics in order to appreciate coloured lovebirds. Therefore I shall not be using any of those terms loved by the geneticist, any coded abbreviations, nor shall I quote percentages. Instead I shall describe the effects which the various factors produce, and how they can be used. But firstly I would like to sketch in, very briefly, the methods we use at Carterton to produce these birds.

GENERAL

The peach-faced is without question the hardest and most prolific of its genus. Although it is true to say that peach-faceds will breed all the year round, and we do have a few pairs breeding in every month of the year, they are more inclined to nest during our spring and late summer/early autumn, the latter period being the time of year when most success is assured. Breeding peters out with the onset of harsh winter conditions, but only because of the

high incidence of dead in shell experienced at that time of year.

I should explain that instead of keeping our birds inside, as I believe many European and American breeders are obliged to do, our stock is kept in unheated outside short flights, the aim being - and one which has been successful - to instill a hardy and robust constitution. It doesn't do to be too dependent upon services which are outside our personal control. This has been driven home to us in winters past. Winter is the miners' and power workers' favourite time to strike, and such disruption, as well as havoc caused by winter storms, has left us without electricity for days on end.

Last winter's weather was the worst ever recorded in our area, and at its coldest was quite equal to Arctic conditions. As a result on the severest days many of the lovebirds, although bodily able to withstand these temperatures, were unable to perch because freezing fog had encased their feet with a thin layer of ice, making them completely stiff. Many of the peach-faceds lost nails and toes due to self-mutilation. The dangerous consequences are that the low temperatures prevent the blood coagulating and cause a lack of sensation. The bird will drink its own blood and continue to gnaw away its feet, allowing other birds to treat it in the same manner. When any were found damaged in this way they were placed in the warm and had their wounds dressed with an antibiotic powder to prevent infection. Even with constant round-the-clock attention, in these atrocious conditions we did lose a minimum number of specimens, yet paradoxically a few late nests hatched, and not only survived but thrived, providing the stamina that these birds can possess.

HOUSING

Although peach-faceds are bred in cages and single pairs, or in large flights as a colony, more consistent and recordable results are obtained by keeping them one pair to a small flight. This is imperative for the serious colour breeder pursuing an ideal. Our flights are four feet long, two feet wide and six feet high. I believe that the height is even more important than a longer flight, as much more effort is required for the birds to rise vertically from the floor, where they are often to be seen, than horizontally from perch to perch, and this strenuous exercise helps to keep them very fit.

Photo by Dale R. Thompson and George D. Dodge



White-faced Blue

NEST

An upright nest box of 1/2" plywood of dimensions ten inches high and five inches by seven with a top lid and entry hole at one top corner is hung about head height. We have a number of willows of various species on our property, so willow branches and twigs are given for the birds to use for their nest construction. This material the birds weave into a mat which extends up the sides of the box and has good qualities of insulation. Willow buds are eaten, but the leaves are removed before the branches are fixed in the flights, because in the past they have caused digestive disorders when eaten.

FOOD

We feed our birds on a mixture of one part canary, one part white millet, one part panicum, one part Japanese millet, two parts sunflower and a smaller amount of hard maize. Apple dusted with vitamin/mineral supplement, and brown bread moistened with water and milk is given in small amounts daily. A large amount of cuttlefish bone is eaten - very essential as the main supply of calcium and always to hand. Grit is given but is not needed in vast amounts. Seeding grass, chickwood, etc., is given in small amounts as available, and

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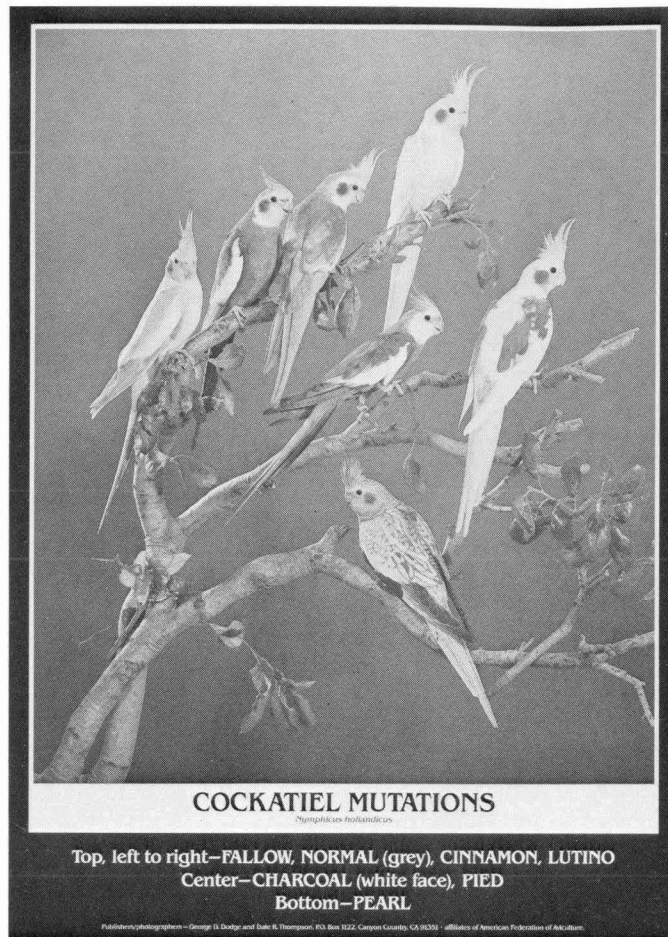
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germinated seed as conditions allow. On this diet the birds thrive and are as prolific as we would wish. Water pots are hung high, because if they are situated on the floor they are quickly filled with stones, food, earth, nest material, etc., which foul the contents. Even so water pots must be cleaned daily.

RINGING

Four to six eggs make up the clutch. These are incubated for twenty-two days; the young are closed rung about ten days old. This I consider a necessary evil and have been forced into using this form of identification by circumstances. Even so I do it reluctantly. Hen peach-faceds particularly, by gnawing at their rings, soon obliterate the incised numbers and letters, and even the anodised colour.

SEXING

Fledglings leave the nest just before six weeks old, and can be weaned between a fortnight and three weeks after. About this time they are surgically sexed; results are recorded together with their percentage, hidden factors and any other relevant information.

It may be hard to believe that birds of such a tender age can be sexed by laparoscopy, but this is a fact. The hen's ovaries are of course at a rudimentary stage of development, but the testes of a number of very young cocks have been found to be as fully developed in appearance as adult birds. The closing of the incision by a small stitch helps minimize the occurrence of subcutaneous emphysema, a condition which we have had occur rarely - whereby air seeps in between the outer layer of skin and the inner layer of tissue. The bird 'blown up' to be almost as round as a tennis ball in extreme cases, but if left I have found that the trapped air will dissipate over a number of days, with no apparent detrimental effect. The majority of our young lovebirds are now surgically sexed as a matter of course before being sold, and this proves to be of great benefit to both ourselves and our customers.

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**INTRODUCTION TO
COLOUR BREEDING**

I was attracted to peach-faceds by the emergence in several parts of the world of various colour mutants, so I set about importing specimens from Europe, America

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and Australia. To build stable strains of these colour varieties the root stock was chosen as some large dominant pids which has already proven qualities of hardiness, reliable breeding ability and possession of a good deep ground colour - qualities which were unfortunately lacking in some of the imported specimens in various degrees.

WHAT IS A MUTANT?

A mutant is a change in the form, size or nature of an animal or plant. Sometimes the change is spontaneous through a quirk in the subject's cells at its conception. At other times it may be forced to change gradually through an alteration in its environment. A spontaneous change can work to the detriment of the species, making it less successful at surviving, in which case it will be quickly extinguished or, if the change is beneficial, it may even begin a new sub-species.

It must be emphasized that a true mutant is not produced by hybridisation of one species with another, but occurs as a 'sport' within a true species. Even so the breeder may be able to discover hidden factors by line-breeding or inbreeding, within a species, and be skilled enough to establish them, using his imagination to create new varieties by combining one with another.

It is a mistake to think that a mutant variety can be created by cross breeding one species with another. This does not create 'mutants' but 'hybrids' which could ultimately be detrimental to the survival of those species concerned in their pure form. If hybridisation were to be encouraged and go on unchecked, the result would be aviaries full of worthless mongrels, while the pure species would decline and disappear.

It is feasible to introduce (under strictly controlled conditions) a mutant variety from one species into another by cross breeding, but this would take many years of back-pairing to eliminate the character of the introducing species, and the waste products produced on the way to this goal should not be passed on to other breeders.

At present, with mutant peach-faceds, we are concerned only in a difference, whether startling or subtle, in colour.

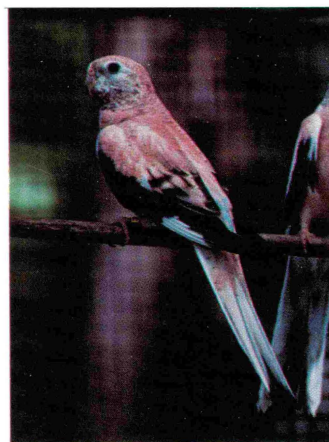
PIGMENTS AND THE TRANSLUCENT CLOUDY LAYER

A bird's feathers, skin, eyes, nails and bill are coloured by pigments which have evolved by natural selection as the best camouflage within its habitat, best attraction for a mate and so on. The peach-faced has at the very least two basic types of pigment in its plumage:

Firstly RED & YELLOW known as PSITTACIN, the name coined by George Smith. Up to now these have seemed to be

Color Varieties . . .

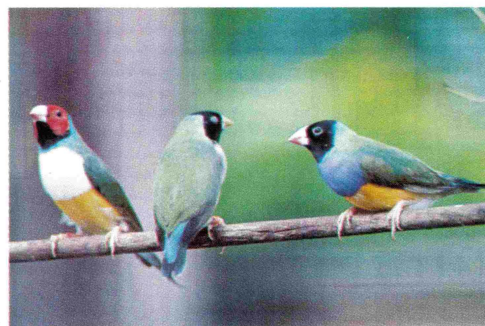
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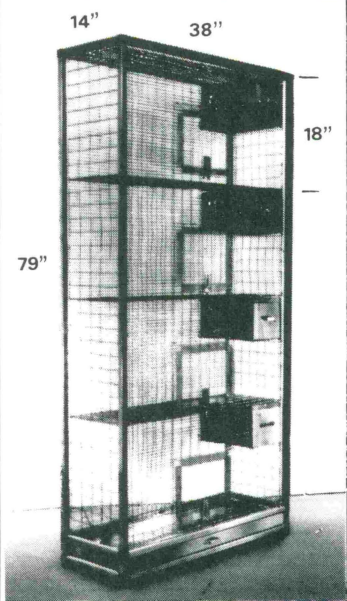
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linked, and if one was diluted or missing then so was the other, but Mr. Lee Horton in California may well be on the way to establishing a variety which can separate and eliminate the psittacin Red from the psittacin Yellow. Psittacins are present within the outer layer or 'cortex' of the feather barbs.

Secondly BLACKS and BROWNS, known collectively as MELANIN, a substance to be found in other creatures besides birds. The experts credit psittacine birds with only *one* melanin pigment, explaining that the cinnamon mutant is not the result of one of various types of melanin being absent, as with canaries, but that the brown colour is created by the action of all the granules of the one and only melanin pigment becoming smaller. This seems rather unfair on the parrot tribe as even the little canary can boast four pigments - lipochrome (the canary's equivalent of psittacin), phaeomelanin brown, eumelanin brown and eumelanin black. Melanin granules are present within the centre core of the feather barbs. This is known as the 'medulla.'

Scientists tell us that a blue pigment does not exist in lovebirds but that the blue colour, and consequently the green, comes about by an altered reflection of the melanin pigment through the cloudy layer surrounding the medulla. A particular variety of mutant causes this translucent cloudy layer to be of a slightly thinner construction, which at its most extreme can virtually eliminate the blue effect.

If one or more of these pigments which have been spoken of is missing, a striking difference will be seen in the bird's colouration and a mutant variety is created. We refer to these mutant varieties as 'factors' and these 'factors' for missing or altered pigments can be combined to create 'combination' or 'compound' varieties in double or multiple forms, often resulting in specimens completely different in colour and markings from the original 'factors' involved, examples of which I will show later.

I prefer to leave the explanation of the science of genetics to those better qualified than myself, and usually stick to breeders' terms which are less off-putting for the beginner to colour breeding. I am more concerned about explaining which colours are manifested by the presence or absence of these pigments.

We can make some kind of parallel, oversimplified though it may be, between the colours in a lovebird and the technique of colour printing. To build up the full range of colours in a print, quite often only four colours of ink are needed: yellow, red, black and blue. When these colours are applied in varying densities to a sheet of white paper, the full range of the colour spectrum can be

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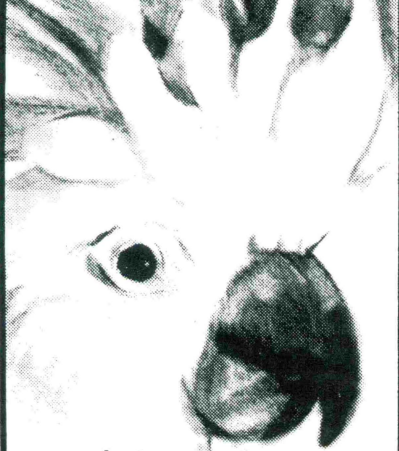


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The equivalents of printers' inks in peach-faced are: *PSITTACIN* - which manifests the reds, pinks, yellows and creams; *MELANIN* - which manifests the blacks and browns; and thirdly: *The action*

of reflected light through the cloudy layer in feather material which effect, combined with melanin, creates blues and, combined with melanin and psittacin, creates greens.

So we see that mutant colour is not created by the *addition* of new pigment but

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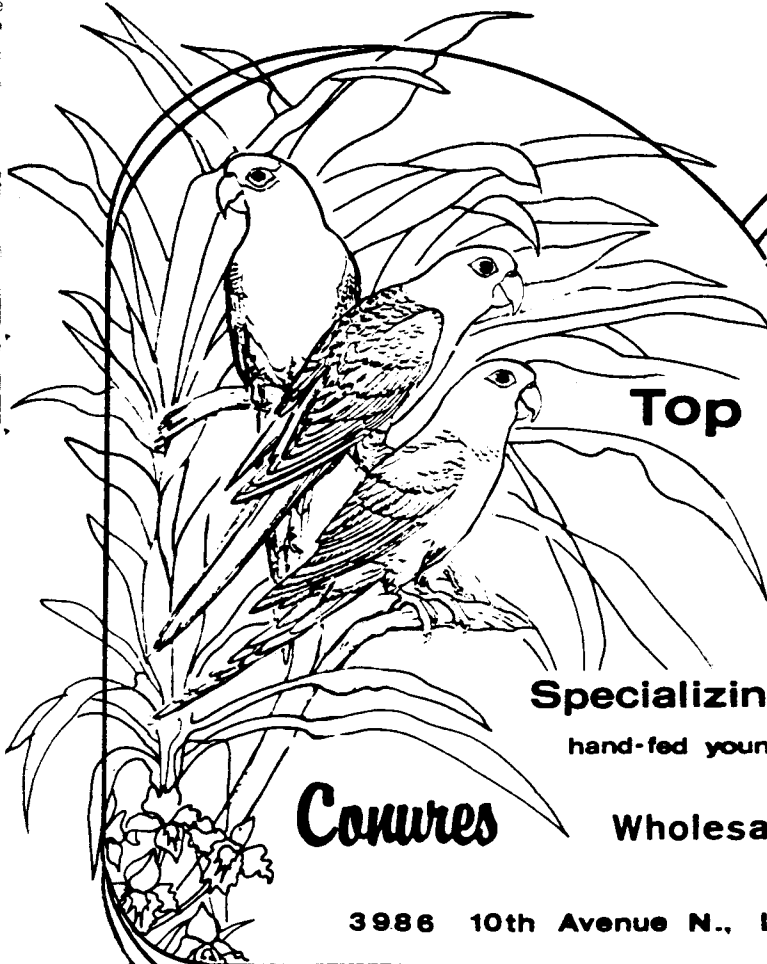
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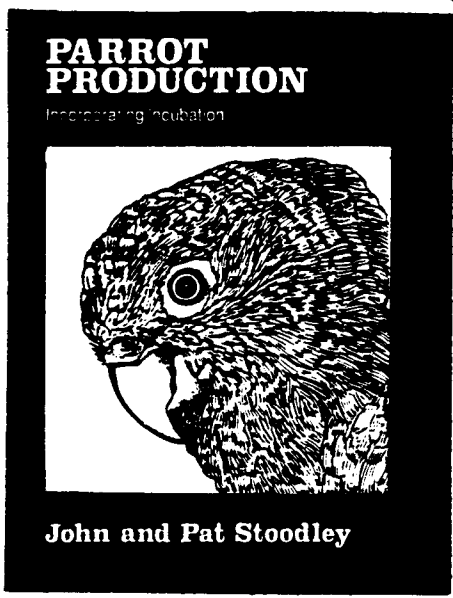
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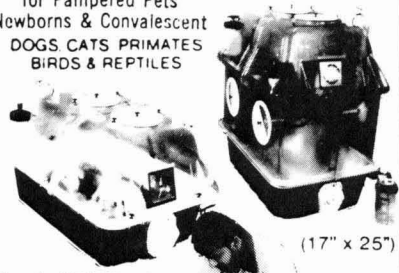
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Editors.

simply through the *subtraction* and alteration of existing pigment. The presence or absence of psittacin affects 'ground colour,' while the varying presence of melanin gives us the contrasting 'melanin overlay.'

THE PRIMARY COLOUR FACTORS

The following notes include my revised suggestions on peach-faced nomenclature.

Firstly I would like to make the point that the ground colour of the wild form is yellow. I have in the past referred to the wild form as 'normal.' I now suggest that 'normal' should be deleted and replaced with 'green.'

We can separate primary mutant factors of the peach-faced into groups. The first group we call 'Ground Colour Modifiers,' the second 'Melanin Overlay Modifiers.' In the first group we have:

Marine - which gives approximately a 50% *even* reduction of psittacin, leaving us with a sea-green body colour and salmon forehead. When combined with a factor which eliminates melanin, the ground colour is found to be 'Cream.' Since the establishment of a second 'false' or 'semi-blue' (i.e. White-faced blue) it has become obvious that when the 'true' blue finally arrives, confusion will reign unless 'blue' is removed from the two 'false' blues descriptions. The ideal would be that where possible all primary mutants had a *single* title which was not named after a definite colour, thus allowing easy assimilation into a structure which must necessitate combinations of names. In this case 'marine' would be appropriate, giving merely an impression of a sea-blue/green without reference to tone.

This colour has also been known as pastel-blue, par-blue, Dutch blue and simply as blue, which of course it is not. This factor is one which is recessive to green.

Parallels with the 'Marine' factors effect on colour can be made with Blue Splendids (note the similar shades of salmon and sea-green), Yellow-faced blue budgerigars and the dominant white factor in canaries which show remnant areas of yellow where the lipochrome pigment is most concentrated in the wild form.

Hatchlings have a white down.

Lavender: This factor gives approximately a 60% to 75% *uneven* reduction of psittacin, leaving us with an almost blue body colour of a slightly greyish tint, but with varying amounts of greenish patches on back, wings and upper breast particularly. Only a pale trace of pink is left on the cap but, unusually, pied specimens show more pink and yellow on the head. With the dominant pied factor the melanin is eliminated in a patchy manner. Here we have a similar effect with the psittacin pig-

ment. It could almost be termed a psittacin pied.

This factor is commonly known as white-faced blue. It is a possibility that the variety was given that name as a result of my mention of a 'true, white-faced blue' in "Lovebirds and their Colour Mutations." In fact, this emphasis on 'white-faced' was simply to drive home the fact that a true blue must manifest no cream, yellow, pink or green in its plumage. It is paradoxical that this name should have been used for a variety which can manifest these colours, even though to a minor extent. I have suggested 'lavender' as a less definite name, giving the feeling of a dull greyish blue/green. On the continent of Europe I believe it is known as double blue or German blue.

I only have limited experience with this colour, and experienced breeders still seem unsure about its genetics, but it would seem to be recessive to green but dominant to marine, and may exist in single and double factors. I would term the ground colour as 'ivory.'

A greenish specimen with an almost white face may have been developed from this factor.

Hatchlings have white down and, the few that I have seen, a yellowish tinge to their feet, etc.

Blue. Yes, I know that a true blue is apparently still non-existent, but I would like to clarify that such a bird would have no trace of yellow, red, green or pink and that its ground colour would be pure white. My previously suggested names for the 'false' blues would leave provision within the framework for the blue and its compound varieties when it finally comes to light.

Parallels with a blue peach-faced could be found in the recessive white canary, sky-blue budgerigar, blue masked, blue quaker, blue ringneck and white-headed cockatiel.

Red Suffusion: Birds with complete or partial red suffusion occur with increasing regularity. Whether it can be inherited or is due to a disturbance in the subject's metabolism remains a bone of contention. I can only relate that I have produced such birds to the second generation and have had it occur in both dilute and lutino specimens.

This could be described as the spreading of psittacin red to the detriment of psittacin yellow, *or* the alteration of psittacin yellow to psittacin red.

Yellow-faced. This is the most intriguing of the new mutants and is being established by Lee Horton who tells me that information is still at a minimum. But this does mean that a major breakthrough has occurred with separation of red psittacin and yellow psittacin; or alteration of psittacin red to psittacin yellow, whichever

the scientists decide to be so.

Included in the second and largest group of mutants - the Melanin Overlay Modifiers - we have:

Ino - a factor which has many parallels in aviculture. It is sex-linked and affords total elimination of melanin. The 'Ino' form of green is 'lutino'; of marine 'creamino'; of lavender 'ivorino' and of a blue would be 'albino.' Hatchlings have pink eyes and no mark at the base of the bill.

Dilute - so named because it dilutes partially the melanin pigments. Dilute is a term used widely in aviculture, especially with canaries, zebra finches and latterly budgerigars. It is recessive to green in both its common form of American dilute (heavily suffused) and its less common form of Japanese dilute (lightly suffused). These types are also known respectively as Imperial golden cherry, par-yellow and American yellow (the A.L.B.S.* term), and golden yellow, Japanese cherry and Japanese yellow (the A.L.B.S.* term).

I would prefer them to be identified by a prefix naming their country of origin or establishment and genetic type if required.

Dominant pied American dilutes have been mistaken for Japanese dilutes in the past.

Incidentally, dilute and split dilute birds (of the same density as the American strain) were imported by me from Australia and breeding results proved them to be genetically the same as the American variety.

Hatchling American dilutes have plum-colored eyes, which soon darken, and a paler than normal mark at the base of the bill.

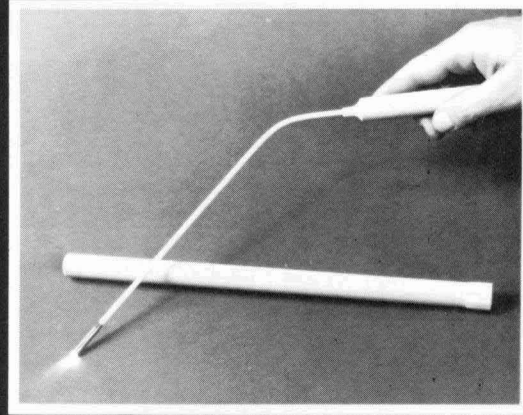
Cinnamon: This is a universally accepted term for a factor which eliminates melanin black and retains melanin brown. The variety is sex-linked and originated in America. It is attractive when combined with marine, but less so when combined with pied. A combination of cinnamon with two dark factors, if not already completed, could prove to be the nearest we could get to a fawn or brown bird with a red and pink head.

Hatchling cinnamons have a light plum-colored eye and paler mark at base of bill.

Australian Cinnamon: This variety could come to the fore in the next few years. Also known in Australia as mustard, it is said to be sex-linked in its inheritance. This mutant causes even more dilution of melanin on the body areas than the cinnamon of American origin, apart from the rump which seems to retain almost as much depth of blue as a green specimen. Could this be an indicator of different melanin pigments? Unlike the Australian recessive pied, the psittacin red on the

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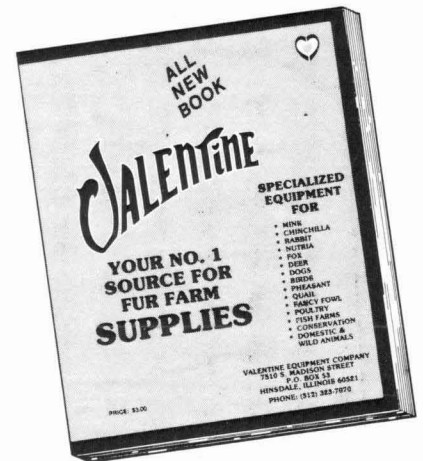
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bird's head retains its full area and brilliance.

German Fallow: Herr Bodo Ochs in West Germany has written to me of his strain of fallows originating in West Germany. They are of the appearance of a pale type of cinnamon, somewhere between the American cinnamon and the Australian cinnamon, but with the most vivid red eye, retained into adulthood. Herr Ochs says the factor is recessive.

Dominant Pied: This factor manifests itself in a patchy elimination of melanin. It is dominant and said to be existent in single and double factor forms. This fact bears no relation to the amount of variegation, but to the bird's ability to reproduce itself. My own initial experience bore out the fact that a double factor pied would produce no greens - only peds, but recent years' breeding have caused me to question this assumption and after breeding several hundred peds I can honestly say that I have no pairs which produce all peds. This has put a doubt in my mind about the existence of double factor birds. An unusual happening which I have experienced on several occasions has been the moulting out of a normal-looking adult bird into a pied, which afterwards also possessed the ability to reproduce peds. The cap of pied birds is quite often narrower or ragged. It is also true that the amount of variegation spreads after the first moult and improves within a specimen up to at least three years of age. I have also found that those specimens exhibiting maximum variegation tend to produce birds mostly like themselves, with a small amount of green specimens showing a presence in the same nests.

A further thought on this pied factor. We know that the epidermis is affected visually, but is it logical that this factor when not in evidence externally could be present in *internal* tissue which could, perhaps, burst outward as the specimen matures, causing the change of a visually wild form to a visually mutant pied form? We know already that areas of variegation can increase greatly, simply with age.

Many specimens also show a partial overall dilution in remaining green areas. This, too, has yet to be adequately explained.

Hatchling peds have no mark at the base of their bill.

I have suggested that birds of slight variegation could be described as 'lightly pied,' those of substantial variegation as 'heavily pied' and those exhibiting almost complete lack of melanin as 'full pied.'

Australian Recessive Pied: This mutant factor brings about an almost clear bird by its action of variegation. The psittacin red of the cap area is considerably lessened,

which is in character with the dominant pied factor. Melanin deposit is retained in the rump area and tail. Conversely it is said that the bills of fledglings are not like those of dominant pied fledglings, but like those of dilutes, retaining the mark from the base of the bill, though in a pale shade. Australian fanciers speak of green birds with pied caps being present among strains of this variety, which once again gives credence to the pied theory, as also does the varying amount of green flecking across the backs of individual specimens. I have noted that Lee Horton of Agapornis Acres confirms what I have suspected, that this mutant is a pied of a recessive nature. It could well be compared to the recessive pied budgerigar of European descent which can also exhibit maximum variegation.

The Dark Factor - really belongs to neither of the two preceding groups because it does not lessen either the psittacin or melanin pigments and its effect is achieved by an alteration in the structure of the feather material. This causes the reflected light from the melanin granules to give the appearance of darker greens and blues when present in single factor form, and replace green with khaki colour and blue with grey in double factor form. The factor is dominant in its inheritance and its origins lie in the island continent of Australia.

Single factor birds are known as 'jades' both in Australia and Britain, while double factor specimens are called 'olive' - this of course when combined with green.

It has an exact parallel in the budgerigar, in which species the combination of the dark factor and the blue factor illustrates a phenomenon relating to production of specimens exhibiting both factors visually. The gist of the matter seems to be as follows. If a dark green split blue has inherited its dark factor from an olive parent paired to a sky blue, it will be able to produce far less dark factor blues when it is itself paired to a blue specimen than it could if it had inherited its dark factor from a mauve paired to a light green.

Now this, I believe, has yet to be proved to be applicable to the peach-faced and we must remember that the two nearest factors we have to blue - marine and lavender - may or may not interact in the same way.

Some breeders believe that the dark factor deepens the ground colour. I cannot say that I have found this to be particularly noticeable with pied dark factors nor dark factor lutinos.

Naming of dark factor peach-faces is another ticklish problem. I would suggest that 'dark' and 'olive' be used with yellow ground varieties and that 'dark' and 'slate' be used with cream, ivory and (when it ar-

rives) white ground varieties.

e.g.

Green, Dark Green, Olive Green.
Marine, Dark Marine, Slate Marine.
Lavender, Dark Lavender, Slate Lavender.
Blue, Dark Blue, Slate Blue.

Because of a number of unexpected results with single dark factor breedings, it has been a vague suspicion of mine for some time that there may be more than two graduations of dark-factor and that it may be carried in even weaker form than the recognised single factor. Where I would have expected to produce a percentage of olives, only dark greens have been produced, these being bred off definitely *visual* dark greens that were produced from pairs of single dark factor birds (dark greens).

I dislike raising a question mark over an established theory, but though it is only a suspicion I think it is worth investigating.

Pure Greens. I would like to emphasise the importance of the maintenance of strains of completely pure green birds which carry no hidden factors. These are most useful in discovering the nature genetically of new mutations which, in my opinion, should always be paired *only* to the original wild green until the new strain is firmly established. This means that the new variety is far less likely to become adulterated by sex-linked and dominant forms which may swamp out a delicate recessive form so that it is lost forever. This has already occurred with rare recessive colour varieties of the budgerigar.

Compound Varieties. Fortunately for us the production of mutant coloured birds is governed by patterns which can be discovered and used to predict what our expected results will be when one is cross bred with another. To work out the shortest route to the production of compound varieties we must first discover which are recessive, dominant and sex-linked and what the pecking order of these factors may be. Inheritance has been purposely skirted around in this paper, so as not to cloud the broad picture of peach-faced colour breeding as I see it. ●

Editor's Note: The names we humans call things by are confusing and indefinite. This is even more true when trying to describe subtle shades of color. There is not at present, a consensus on the nomenclature of the various lovebird color mutations; although several prominent specialists are trying to hammer out mutually agreeable terminology. The "Watchbird" remains aloof from this struggle in semantics and does not present these names or descriptions as the final word. We merely reflect the terminology used by the author in the text and by the photographer in the captions.

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