"Feather"

*The following article has been compiled from a lecture given by Robert Manvell to the members of the Newcastle Budgerigar Club of Australia.*

What is Feather?

If you were to give a chemical analysis of feathers it would be very complicated and confusing to most fanciers. Nonetheless, we should consider feather is almost totally made up of crude protein, together with other components such as minerals, amino acids and vitamins etc. The latter constituents being in very small proportions and not an overly important consideration when breeding quality Budgerigars. We can see from a feathers protein content, the need to feed your birds, especially exhibition type, the best feed money can buy. It is definitely a false economy using sub-standard seed. We should also deduce from this information, the need for an additional high protein feed because of the larger feathers our birds now carry.

Feather as the theory goes is a modified scale with a very long history. It is put forward by Paleontologists, the budgerigar of today has prehistoric ancestors, meaning it has evolved from some Dinosaur like creature. The reason for their conclusion is; both scales on reptilian type creatures and feathers on birds are formed subcutaneously (under the skin). Moreover when feathers and scales fully emerge they are dead and cease to grow any further, both are held in follicles which lie beneath the skin.

Supposedly the common ancestor linking Birds and Reptiles is a prehistoric creature which existed some 140 million years ago, called Archaeopteryx.
That’s a mouth full! It is the first fossil which had scales along with feathers, the feathers growing down the side of its long tail and its front legs appeared to indicate early wing formation. Even so Archaeopteryx could not fly.

Budgerigars History.
My information for this part of the lecture was obtained from discussions with the curators of birds at the Australian National Museum, Sydney.

Australia, Africa, South America, India and Antarctica were joined together making up one very big land mass, which has been referred to as Gondwanaland. Approximately 100 Million years ago Gondwanaland broke up, the countries separated and started drifting toward their current positions on the globe. Roughly 15 Million years ago Australia was covered by Forests and the centre of the Continent had massive inland lakes. Somewhere around this time the climate began to slowly change, the Forest areas died leaving Deserts and large depressions where this inland sea as it was called previously existed.

I mentioned the above because I had the notion our little friend the Budgerigar could have been very different to the one that exists in the wild today. My thoughts were sort of legitimised when it was pointed out by the Museum, the Budgerigar, Rosella and Night Parrot all have common ancestors. DNA testing has apparently validated this. The Wild Budgerigar could have been much bigger than it is today. It would have had a very constant and rich food supply, it would not have had to fly the long distances it does today, the climate would have been more temperate with a less hostile temperature range and there would have been an abundance of water. Maybe these points substantiate my beliefs. If this theory is correct, then "have we seen the maximum size our Exhibition birds can attain”? Maybe not, most of the emphases of improving the exhibition bird has been put into feather increase, because this is definitely the simplest route over the short term. However, over the long term, probably well past our lifetimes, I think the dimensions of the actual frame of the bird can be increased dramatically as has happened with other forms of livestock. Look, how far we have progressed with the Budgerigar, over the past forty years. I have seen some truly massive individual Budgerigars in my travels, so maybe their past is still in the genes.

According to the Museum, they have recently found a cave at one of their dig sites, located in South Australia. This cave was the home of a extremely large carnivorous Bat which consumed large numbers of budgerigars. This Bat evidently took the Budgerigars back to the cave to feed its' young. In the process it dropped a large quantity of bits and pieces on the floor of the cave and these became fossilized. These were the first such fossilized Budgerigars to be uncovered and have been dated at approximately four million years. This would establish the wild bird of today has, remained almost unchanged for the past four million years.

The above was a remarkable find because the bird, being so small and its bones so fragile, it would normally disintegrate long before being frozen in time. Also Budgies were prime fodder for the other inhabitants of the arid areas, which meant they would not last long on the ground if dead, wounded or ill. This could explain why the wild or pet shop type bird survived, being able to fly on leaving the nest. Because if it resembled our exhibition type birds which take a while to get airborne after leaving the nest, they would have been gobbled up long before they had a chance to pass their genes on for prosperity. Again natural selection, survival of the fittest.

What are Feathers for? The overall appearance of our exhibition Budgerigars is the result of a combination of many components. Bone structure, skeletal dimensions, muscle, fat and the all-important feather are the basic components which make up our Budgerigars. Whether the bird is of excellent quality or not will depend on the configuration of these components. The way a bird controls its feathers and the direction they are held, will also have a major bearing on our Budgerigars appearance.

Feather is probably the most important and least understood aspect of breeding exhibition quality Budgerigars. Even so, the other components must not be ignored.

Feather has responsibility for the following list of features. This list is only basic; you may be able to add some more features to this list.

Variety;
Whether the bird is a Opaline, Cinnamon, Clear-wing or Pied, its variety is expressed by feather. Colour; The birds colour is expressed by feathers, that is blue, violet or dark green Etc. Also if the bird is of good colour or not it will be displayed by feather. Markings; A birds markings are also displayed by the feathers. Wing markings, spots etc., both good and bad markings must be considered. The markings on a bird are something which is neglected by the general fancy. We should consider the definition or clarity along with intensity of markings when pairing to produce the ultimate bird. A bird with exceptional markings, always stands apart from the less than perfect counter parts. Size and Shape of the Bird; The more feather a bird has, generally the larger it will appear. The shape of the bird is a combination of the Skeleton, Muscle and Fat as mentioned earlier along with the feather a bird carries in the right places.

The all-important Top end.
In my opinion the most important part of the Budgerigar and the part which attracts immediate attention is its Top End. Even though we must consider the whole bird, the head and face seem to be so important for that first and lasting impression.

Mask;
Again it is impossible to have a deep mask without length of feather. Spot (size/shape); To have a large well shaped spots you need to have a feather that is proportionally wide and long. It must be obvious we cannot have a large spot on a small feather although the reverse is true. I do not have an answer to controlling spots. I think spots are inherited randomly with regards to shape and size. However, if your birds are from a family strong in this feature, you are well on the way to having good spot on your babies. The shape and position of the spots should not be neglected either, on at least one side of the pairing you should have round and reasonably well positioned spots. This will help alleviate misshapen spots and split masks in your birds.

Cap;
The cap on a Budgerigar is the direct result of the length and width of the feathers on the top and over the crown of the head. Feather direction is so important in this area, especially when the bird relaxes, and the top end feathers are “blown”. If you have the correct feather in this area and the bird has the ability to unleash the cap feathers, transforming its top end to give the frontal, lift and brow we now require. The crowning glory of the Budgerigar!

Back skull;
A bird has to have a lovely collar of feather which extends up from the shoulder region, filling in the portion of the bird which starts about the crown of the bird and flows over to the back of the bird ( nape) in one extended graceful sweep. Back skull is the feature which gives the birds the appearance of having a beautifully rounded head from which ever angle you view the bird. Without this feature in your birds, you will not achieve a good back line. Poor back skull, equals poor back line. Nothing looks worse than birds which cut away behind the head. Birds that lack back skull should be eradicated immediately as this is a very invasive and dominant fault, if not kept in check.

Shoulder;
This is a debatable area, I think good shoulder is a combination of the birds skeletal and muscular system combined again with feather. To have great shoulder one would also need this wonderful full collar of feather around the top end of the bird, from the wing butts upwards. If your birds do not have shoulder they will not have width of mask. Just a side issue, I recently over heard a judge extolling the virtues of shoulder on a particular bird. The said bird had a narrow mask with average size spots, all overlapping, which indicates a lack of shoulder. I would suggest this Judge did not have a clue what shoulder was, let alone be in a position to instruct the fancy on such an important feature.

Along with the above features the bird must hold each individual feather around the beak or facial area in a different direction, giving the impression of the feathers radiating out from the beak. Thus giving the bird a tucked in beak and head width, the hardest feature to obtain and retain.

Feather Descriptions Misleading
To date feather has been discussed by the fancy as being Yellow, Intermediate and Buff this is a dreadful over simplification of a very complexly structured piece of material. It would seem this description was put forward many years ago. I am led to believe it was taken from the canary fanciers of the time, who used it as a classification of the colour of their birds feathers. I am not convinced it had anything to do with large or small feathers as both buff and yellow coloured canaries are essentially the same size. Members of the hobby, since and to-date, have endorsed this concept by adopting its usage without giving feather on Budgerigars in particular, too much thought. We probably could justify it as being a broad classification of feathers. But apart from that, this simplistic classification is useless and basically meaningless. Most experienced breeders would realize feathers are much more complex than that.

I found agreement at the Australian National Museum, when I put forward my supposition; all feathers on birds of the same species were different. Furthermore, each species of bird is different from each other species, a duck has a different feather structure to a sparrow as an example. Most importantly, all Budgerigars have a different feather structure to each other, it could be considered a bird’s finger print. Therefore, no two Budgerigar’s feather structures are exactly alike. The difference between individuals may be unperceivable, but there will be a difference!

Individual Feather characteristics.
Following are the feather variables we must contend with when breeding birds for exhibition. Each one of the following feather features has a bearing on the visual qualities of our birds.

Length
Length of feather is self-explanatory. Our bird’s feathers can be short as is the case on a pet bird or they can be extremely long, also they can be any length in between. Feather length alone is not responsible for the Supreme exhibition birds of today, this is a common misconception. Granted it is important but only in conjunction with the following feather features Width: - Width is the distance across the feather, a feather can be narrow or wide and as above any width between these parameters. From my observations I believe feather width acts independently to feather length. Shape: - The feather can be rounded, squared off or even pointed. Possibly feather shape could be almost limitless. Thickness: - Feathers are not mono or even bi-dimensional. They are three dimensional like everything else, not only does a feather have length, width and shape, it also has thickness especially the feather shaft. This could be explained as the distance from the front or outside of the feather through to the inside or back of the feather. If you have a thinner feather and still maintain the other dimensions of width and length, the bird will exhibit all the great features which come with the extra larger feathers whilst keeping the bird tidy because the feathers can lay closer on top of each other.

A recent article confirms my belief in this regard, Mr. Jo Mannes from Germany has had his bird’s feathers measured and compared to UK feathers under an electron microscope, and this was the case. His bird’s feathers are in fact thinner in the shaft than comparable size feathers in the UK. Maybe this is why his birds show a remarkable tidy finish when compared to the big feathered English style Budgerigar.

Structure
feather structure is it’s actual components, that is the feather shaft, the down, the barbs etc. It would be reasonable to expect and is the thinking of some experienced fanciers, a new mutation or variety brings with it a new type of feather construction. Thus in some cases it is capable of changing other varieties feather structure when utilized with them, both good and bad, the Opaline and cinnamon would be good examples. The spangle is the most recent on the scene and it appeared to have some very positive influences on all varieties of Budgerigars. It should also be noted, the spangle was first introduced into Germany via Switzerland and this variety may be an important factor in their new style of budgerigar. Without harping on the Mannes birds, it has also been substantiated his feather structure is different to the norm. The electron micro scope has indicated his feathers have more barbules per millimeter than comparable size feathers from the UK. A possible explanation as to why his birds while retaining their massive bulk appear to have a beautiful finish to their feathers, giving them a delightful soft sheen.

If I had the chance, I would question as to which varieties of birds the feathers for these studies were collected. It would certainly give a fuller picture to the findings. Just putting my thoughts forward, it would appear to me, the finish Mannes has achieved, on his birds is not that dissimilar to the finish on Cinnamon Budgerigars. It may be the case and is possible the cinnamon characteristics could have crossed over and aligned themselves with the elementary budgerigar feather genes. Therefore, through selection Mannes has fixed this across all varieties in his stud.

Having said that, I hope the fancy is giving Mannes the credit he deserves. I Guess from the statement, "Mannes has a new mutation of feather in his aviary", some are dismissing his success as some sort of luck. I have been fortunate enough to spend considerable time with Mannes on two occasions over the past couple of years. From these visits I would have to say "I have not met anybody as observant as Jo Mannes, with regards to budgerigars". The feathers they are claiming are a new mutation were most probably present in many aviaries at various times and were passed over by breeders who were not observant enough or did not have the vision, forethought or skill Mannes has demonstrated. To claim his birds are anything but a result of his ability would be wrong.

Down
The amount of down at the base of each feather will have a definite bearing on the appearance of the bird. The down acts as a packing underneath the feathers, holding them off the body giving the bird the illusion of being larger. During a lecture given by Fred Sherman some years ago, he claimed to have built his formidable stud by the observation of feather down on the babies in the nest and selecting for this when pairing up. So down is definitely very important in the appearance of the finished bird. Density: - The density of feather is the number of feathers on a bird. Birds which impress me appear to have many more feathers on them than the average bird. Density of feather also keeps the bird looking better under the stress of judging or whatever. This feature is an absolute asset in the production of top quality Budgerigars. Somehow it gives the impression of the bird being tight feathered which is not normally the case with heavy feathered birds. I have noticed on my better birds, more feathers on the top end, this coupled with good feather structure gives some charming headed specimens. Distribution: - The location of the feathers on the bird. As above we are looking for a concentration of feather on the head, a lovely collar of feather to give back skull and a full back line whilst enhancing the shoulder and width of mask. You can have a bird with lovely feather but if it is in the wrong places it is useless, you will end up with nothing but bags of feathers. I believe this was the case with the old Australian birds, we always had the feather qualities we needed, before we started to import birds from the UK. However, the birds we were breeding had the feathers concentrated in the wrong places. Most particularly on the top end of the Budgerigar I.e. Head, shoulder and face.

From the above feather features we can see how meaningless the words Yellow and Buff are as an explanation or description of the particular feather any of our birds are carrying.

Some of the above individual feather features are very hard to identify, however if you study your birds overall feather appearance, whilst keeping the above in mind, I am sure you will see your birds in a different light.

The mode of inheritance of feather.
My observations would suggest the Yellow to buff pairing theory which has been touted for decades is without foundation. There is nothing I have seen which confirms the pairing of yellow or finer type feathered birds to Buff or longer feathered birds produces a blend somewhere in between, described as the intermediate feathered bird. Intermediate birds being put forward as the required show bird. There is also no evidence to substantiate the continual pairing of the so called buff birds together will make your birds become more or double buff. This concept would have its beginnings placed some sixty years ago. I can’t understand why they keep pushing this theory, it is obviously wrong. Feather is not passed on in such a simple manner. After many years of breeding and studying the feathers of exhibition Budgerigars, Canaries and Finches, I still do not believe it is possible to manipulate feather. However, I will explain latter how to increase the possibility of producing better feather quality and thus better birds.

It is also said, "Buff feather is recessive"! How can it be? If you pair two so called buff birds together what do you breed? (Answer from the floor) "Anything and everything, no consistency what so ever". Exactly! Blue is recessive, if you pair two Blues together or two Recessive Pieds together you will breed 100% Blues and Recessive Pieds respectively. If this is the case, " how can buff feather be recessive"??

Leaving the above aside, I will endeavor to explain how I believe feather is inherited. Basically we need to understand; features, whether they be on a Budgerigar or any living thing, are passed on to the next generation by many thousands of genes. These genes control the features and everything to do with the offspring. Features are either passed on fixed or in a state of constant change.

The first example where the feature is fixed is called Discontinuous Variation: -this is where there is no variation passed on to the offspring. My belief is this type of inheritance could be controlled by one single gene and therefore easy to predict and control. An example of this would be the Ino. or blue gene in Budgerigars. These features are passed on without change, in either a visual or latent state, they do not change they are either in the genes or they are not.

The second example which is technically called Continuous Variation: - is where the feature is passed on to the next Generation in a modified state, it is Continuously changing from one generation to the next. This inheritance phenomenon could be the result of the cumulative effect of many and possibly hundreds of genes, and maybe in the case of overall feather quality and features even thousands of genes. Consequently, feather quality is virtually impossible to control or predict. Examples may help to explain, a Human finger print is continually changing, there are no two finger prints on Earth the same. Human height is another good example of continuous variation. This is how feather is inherited, in a constant state of variation. So each bird in the nest is, if you like a mutation of its parents and each offspring will be different.

If we take feather as a two dimensional object i.e. just length and width, you can see we have two factors in a state of continuous variation, within maximum and minimum parameters. Leaving aside all the other dimensions and features of feathers which could also in a state of constant change. I would suggest this is why when we pair two lovely birds together we can, and most of the time do, breed less than desirable youngsters! Could this also be why it is so hard to get any continuity of quality in your nests?

"If the above is the case, why bother", I hear you say. Well lucky for us, as we know some human parents have a tendency to produce above average height. As it turns out we also have families of budgerigars or individuals for that matter, that tend towards producing excellent quality youngsters, feather in particular. It is our responsibility to identify these families or individuals and concentrate our efforts into them. These good families will still throw out poor babies periodically because you are working against mother nature, remember she has at least four million years of selective breeding on her side.

Continuous Variation is in essence the basis of Darwin’s Law of Evolution. Survival of the fittest. If species were not in a state of constant variation, there would not be the genetic diversity within the species in order for it to survive in a continually changing environment.

Overall Inconsistency
Budgerigars of excellent quality are few and far between where ever you look. Most experienced breeders would agree breeding outstanding budgerigars is not an easy task. When and if you are lucky enough to breed a very good bird, the perennial problem seems to be producing another one to follow, let alone a nest full of them. Inconsistency seems to be the order of the day.

This was the case during my last overseas Budgerigar visit. I noticed a lack of overall quality in many aviaries. Expecting to see improvement since my previous trip two years earlier, this came as quite a surprise. Some very well-known breeders had a few excellent birds, then their quality drops away quickly. Likewise, some breeders are claiming to have prepotent inbred studs, when if the truth be known they are continually buying expensive high quality birds. Ultimately they are not capable of turning out the winners they claim, they need birds from the famous breeders to keep their names in the lime light. At a couple of well-known aviaries, I visited, the most outstanding birds in the breeders' possession were produced in other aviaries.

No doubt some are using their imported blood as an advertising gimmick to help sell their birds. How many breeders claim they now have the Mannes blood? Whether they have the blood or not is another question! In the same way remembering what happened in Australia with the Scoble auction and the first English imports, everybody claimed to have them. Unfortunately, when it comes to obtaining Budgerigars, it must be caveat emptor (buyer beware).

The Australian scene
A few exhibitors have had early successes with their imported English birds. Mainly because they were fortunate to have their Imports click or they had fat enough wallets to buy superior stock. However, now many do not have the knowledge to carry the birds forward or even maintain their quality. You only have to look in the young bird classes at shows to confirm this, seeing how quickly we have lost the quality. Many of the major winners are two, three or even four-year-old birds and most of these are first generation imported blood. Some fanciers have been continuously importing birds into Australia since the opening of the quarantine station at Spotswood, Victoria - in an effort to maintain or improve their quality, mostly without success! Hanging off the coat tails of our European friends, is no substitute for ability. Accordingly, many of the Imported birds have been wasted by fanciers who thought you could buy instant success. You cannot buy experience or knowledge, and these are the main ingredients missing for continued success.

Australians, in the majority of cases, have only managed to import birds that were blood-line culls from the English breeders. Therefore, they need a lot of work put into them to get the best out. In spite of this some breeders have disposed of imported birds without giving them a chance to prove their worth. Meanwhile these same “breeders” have the audacity to blame the UK suppliers for their results. In my opinion, these "Cowboys" who are thankfully in the minority, are giving the Australian fancy a credibility problem. Fortunately, there are many talented breeders in this country who are prepared to put in the time and effort necessary, without expecting success to be handed to them on a silver platter.

Most importantly the English birds were a tremendous improvement on what we had and we should be grateful for the overall assistance we have received from the UK fancy. Beyond question is the marvelous influence these birds, and not forgetting the UK breeders have had on our hobby.

Notwithstanding the above, having been in the position of an importation syndicate co-ordinator, I feel qualified to make the following assertion. With the current imports we are getting more of the same quality of bird coming into this country. With very few exceptions. With all due respect, the UK quality in general is inconsistent they have their own problems to address. For this reason, the UK breeders cannot afford to part with the outstanding birds in their possession. If we were realistic we would understand this is the situation and cease bringing more mediocre birds into this country. To continue on our present path is a complete waste of time and money. We need to test our own abilities by doing some work with our present imported stock. Rather than continuously "piggy backing" on the ability of our English friends.

"Feather"
Breeding Better Budgerigars
There seems to be a fair amount of confusion within the fancy, regarding the breeding of quality Budgerigars, because there is so much contradictory information passed on. Most of the techniques tried by fanciers do not give the results they were expecting. I think this is because the providers of the information are very experienced breeders, who are giving information about their own birds and experiences. This is fine, only they are in possession of better quality birds than most of us. I have no doubt their information is correct, but it is only relevant to their own birds and as such can’t be considered a generalization. Therefore, what is successful for them would have a very different result if they were working with lesser quality or a different line of birds. So what works for them will not necessarily work in our aviaries. Thus we need to formulate our own strategy with which we can work, to breed better quality from whatever birds are in our present possession. Another important thing we must do when seriously trying to improve our birds, is to be very skeptical regarding the information passed onto the fancy in the way of miracle pairings. I’m sure your aware of the ones I mean, like flecked headed birds carry the feather you want, or use large dirty opalines to improve spot, put spangle into everything they will only do good and increase fertility at the same time. Some fanciers in Australia have become so paranoid regarding the shape of the wings on a bird, they have become oblivious to the rest of the bird. Some of our most experienced judges are indicating a bird is not a bird unless it has head blow. Forget the rest of the bird, head blow is everything. There are literally hundreds of these fallacies. These are the myths to disregard, always look at the complete bird, don’t get sucked into these unqualified fads. To be fair some of the above ideas may have worked but I would suggest in very isolated cases, and remember they are only opinions to explain some inherited phenomena. People who utter these ideas do so without ever proving whether they work or not. If a bird isn’t quality itself or isn’t from a quality family, then it will not help you, regardless of which magical feature it has or variety it belongs to.

If you analyse all the famous fanciers, the ones who have changed the way we think about and look at Budgerigars. The Alf Ormerods (dec.), the Jo Mannes, the Harry Bryans (dec.), probably the South African, Dr. Robertson and indeed a few others, but a very select few. These are the breeders of, not the buyers of birds. The quality of the birds in their aviaries has not been reliant on the quality of bird they can purchase year in and year out, it’s a result of their own ability. These “breeders” all give the same underlying principle to the fancy when probed on how they breed such superior quality stock. Almost always they will say "you must know your birds". This is fundamental to breeding any form of livestock to excellence, not only Budgies.

The only way to get to know your birds is to work with them. Or in technical terms, progeny test or test mate them.
This gives an indication of the capabilities of any particular bird, with regards to passing on features to the next generation. Jim Moffat claimed, the first five pairings each year are the easiest to decide on. Why? Because he re-paired the most successful pairings from the previous season. This is true in my aviary. My birds give their best in the second and third year of breeding. I believe this is because they have shown individually, what they are capable of, and I pair them accordingly.

By “World standards”, I have not produced any what you would consider to be “Super birds”, although my overall quality is not bad, and I have produced a couple of birds with “Grunt”.
Nevertheless, a fair percentage of my birds are definitely an improvement on my original imports and progressing slowly each season. Therefore, from my breeding results over many years, and not with just the recent imports, the only reasonably successful way towards consistently breeding better birds is through progeny testing. This is the strategy to use.
Find out the capabilities of your birds by the babies they produce. As I stated earlier it is our job to identify the birds within our aviaries which breed superior youngsters, and use them.

After a few seasons if you are on the right track, you should find your better quality birds are producing your best young. Always try to work with the absolute cream of your birds. Rather than pairing up everything in the aviary and hoping you will fluke a good one.
Although, this seems to be a current trend with many breeders adding more and more breeding cages. Some have had success with this technique, and they justify it with the old adages, "you only need to breed one good one", along with "breed a lot to get a few". You cannot consider a person who adopts this technique to be a breeder with any competence.
Pure Chance breeding or the numbers game. I liken it to playing Roulette at a Casino.

Always, work with the very best birds you have and give them every opportunity to prove to you what they are capable of.
Take your time, the babies each year will be the sign posts indicating the way forward.

If you are not producing anything worthwhile, and you decide new blood is the only option, please consider this. Neither pedigree, nor a bird’s visual quality is a guarantee it will pass on its good qualities (visual or latent) to its progeny. For this reason buying birds should always be regarded as a bit of a lottery.
Having said that, both visual quality and pedigree are an advantage, when deciding on which birds to purchase. Personally, I lean towards blood line procurements, they tend to be a little more reliable and generally of far less cost.
Therefore, I can afford more blood line relatives from the selected superior family, increasing my chances of success. Only buy out of a good family of birds, regardless of the visual quality offered.
The better the blood line you purchase, the more likely you are to see quality in the youngsters. If you wish to purchase top visual quality, and hopefully save many years’ work, expect to pay handsomely for the privilege.

Remember you are fighting against 4 million years of evolution, thus the bird’s readiness to revert to its natural wild state.
Quality can only be maintained and improved with attention to detail, keen observation and sensible well thought out actions.

Finally, you must select for and concentrate on FEATHER QUALITY!