THE ORIGIN EVOLUTION

HISTORY AND DISTRIBUTION OF THE DOMESTIC FOWL

PART 3 THE GALLUS SPECIES



JUNGLE FOWLS W.J. PLANT

1986

THE ORIGIN EVOLUTION

HISTORY

and

DISTRIBUTION

of the

DOMESTIC FOWL



The author with his favourite bread-the Pekin or Cochin Bantam

<u>PART 3</u> THE GALLUS SPECIES JUNGLE FOWLS W.J.PLANT 1986

William J. Plant 5/1/93

David J PLANT 46 Newcastle Road <u>EAST MAITLAND</u> AUSTRALIA 2323 ist November 1997

TO:

Mr. Elio CORTI

VALENZA ITALY

RE: The Lte William (Bill)PLANT of MAITLAND N.S.W. AUSTRALIA

* Publication of his written work, Research papers, tape recordi -ngs, Books and notes.

As sole Beneficiary of the works of the abovenamed, who was my father I hereby give written permission ,soley to Mr. Elio Corti of Valenza, Italy to reproduce or reprint any or all of the Works of the Late W.J.Plant, at his discretion.

Permission is also given gladly for Mr. Corti to place for resale any of these works that he may abridge or edit ,into Book form also at his discretion.

No barriers at all are to be placed on Mr. Corti's efforts in reproducing these works. Permission is granted with anunlimited time span.

> Yours Sincerely DAVID PLANT

REVIEWED AND PUBLISHED BY ELIO CORTI

VALENZA - ITALY - FEBRUARY 13TH, 2010



ABOVE IS A PHOTOGRAPH OF A PAINTING BELONGING TO THE AUTHOR OBTAINED FROM THE PHILLIPINES OF RECENT TIMES.

IT SERVES TO ILLUSTRATE THE DIFFERENCES IN THE BANKIVA TYPE AND THAT OF THE PEKIN OR COCHIN TYPE FROM THE PREVIOUS PAGE. IT MUST BE REMEMBERED HOWEVER THAT THE COCHIN DISCUSSED THROUGHOUT THE FOLLOWING TREATISE WAS A MUCH LARGER BIRD THAN THE BANTAM SHOWN IN THE PHOTOGRAPH.

ALSO, THE FIGHTERS IN THE ABOVE PHOTOGRAPH WOULD APPEAR TO BE LARGER THAN THE ORIGINAL BANKIVAS. IT IS HOWEVER THE TYPE DIFFERENCE WE ARE MOST CONCERNED WITH.

GALLUS SPECIES

AN INTRODUCTION TO THE GALLUS SPECIES

Looking back through my files it is some 10 years since I began collecting material on the Gallus species which intrigued me so much that I have continued on with the job much to my satisfaction. It has proved frustrating at times, as gathering this material was not straightforward. It took a lot of writing to people whom I thought could assist me with information and in the majority of cases they did just that, and also a lot of reading from the old authors on poultry and other relevant subjects.

It was then a matter of sifting out the material and endeavour to put it into readable form. My original project was the study of the Pekin or Cochin bantam, the results of which I published in 1982. During the research for that book the Origins etc. of the Domestic Fowl in general surfaced and I decided I would continue on with the research on the overall subject.

For those who have read Book 2 CHICKEN BONE RECOVERIES of this series they would be aware that I have broken new ground which was certainly worthwhile as it will be noted a Supplement to Book 2 has been published covering further information that has come to hand since CHICKEN BONE RECOVERIES was published in 1984.

This is something I had hoped for as I was convinced there was much more information to be had if only it could be located. This hypothesis proved correct. For in fact much important material became available, quite a deal of it will throw new light on the origins and distribution of the domestic fowl.

It may be found necessary to re-evaluate some of the material that has been documented previously with no disrespect to the authors, but because of the fact that new finds have pre-dated earlier ones so consequently in the light of that they have to be considered.

I do have myself a fairly comprehensive collection of old poultry books, but have found that many of the authors followed mostly those who had come before them. However I will refer to some of them throughout this treatise. It is my intention to cover as much new ground as possible. Believe me there is any amount of ground to cover.

THE SPECIES

The species that have been recognised scientifically are: Gallus lafayettei (Ceylon Jungle Fowl) --- Gallus sonnerati (Grey Jungle Fowl) --- Gallus varius (Green Jungle Fowl) --- Gallus gallus Bankiva (Red Jungle Fowl). Five sub-species of Red Jungle Fowl are listed by Delacour(1965). They are the Cochin-Chinese, Burmese, Tonkinese, Indian and Javan.

Some years ago I wrote to institutions in Southeast Asia requesting information on these Jungle fowl and did receive in reply detailed material on Gallus lafayettei and Gallus gallus. This I will include in due course.

It has been generally accepted for many years that as Charles Darwin suggested, the Red Jungle Fowl (Gallus Bankiva) was the species that ALL Domestic Fowl descended from. However, Hutt (1949) and Finsterbusch (1929) amongst others questioned this theory. With all respects to Darwin when he wrote the VARIATION OF PLANTS AND ANIMALS UNDER DOMESTICATION he did not have the benefit of Gregor Mendel's paper on the results of his experiments in genetics. If Darwin had known of this work perhaps some of his thoughts may have been modified. I have great respect for Darwin as his work in the field of observation and coalating the facts have been invaluable.

After reading Carlos Adolfo Finsterbusch's COCKFIGHTING ALL OVER THE WORLD (1929) and having myself bred exhibition fowl for some years has given me an opportunity to study the different breeds and note the marked differences in them it would appear that the Bankivoids (Jungle fowl) are a species distinct from the Malay (most probably the descendant of Temminck's Gallus giganteus). We do get variation of course but in this case it would suggest more than just variation is involved. I will quote from Finsterbusch later on about this matter. Finsterbusch made an intensive study of Game Fowl throughout the world and gives plenty of facts to support his arguments.

I would be inclined to go one step further and suggest that the Asiatics (Cochin, Langshan, Brahma) from China are yet another species. If it could-be proved that this were so I would also suggest they be called Gallus pluma cruris (alluding to leg or shank feather), a trait which these three reeds possess.

I will treat the species in detail and put forward the reasons for hypothesis. The differences between the Bankivoids, Malay and Asiatics suggested as different species are so marked that I feel that variation alone is not responsible. Darwin did admit that if any of the breeds had different ancestry to Gallus Bankiva it would be the Cochin. Perhaps all three descended from a common extinct ancestor along different lines of descent. There is no evidence to my knowledge as from whence Gallus Bankiva came. We need the archaeologists to recover some fossil remains in Asia which may provide us with some answers.

As will be noted in the Book 2 Supplement, fossil remains have been identified in Europe as separate species (Gallus europaeus) when compared with Gallus gallus. This somewhat screws up the picture that the Jungle fowl originated only in Asia. The recovery of chicken bones in Northern China of recent times dated around 5000 BC further screws up the picture. All these facts are important in the study of the origin of the domestic fowl.

Throughout this overall treatise I will still quote the earlier material on the subject, although some of it may have to be re-assessed. Regardless of this I still feel it deserves a place in the story. My experience whilst doing this research (which will always have new information coming to hand) is that every little scrap of information relevant to the subject has its niche in the final analysis. Even a few written lines on the subject can lead to something most important.

I will now deal with the species, quoting from a number of works, with some comments of my own. Perhaps some of my readers might add to this information. It would be welcome. Since beginning this research I have always welcomed comments and further information, as mostly we all gain further knowledge from comment and discussion.

GALLUS GIGANTEUS

This species was named by Temminck but is not recognised scientifically. As far as it can be ascertained this species can be regarded as the Malay as we know it today. Finsterbusch (1929) regarded it as a species distinct from the Bankivoids as you will observe from his quotations later on.

First lets turn to Edward Brown RACES OF DOMESTIC POULTRY (1906) p. 60-61, headed MALAY.

Nomenclatures: English, Hungarian-Malay; French, Malais; German, Malayen; Dutch, Maleier; Danish, Malayere; Italian, Malese; Spanish, Malaya.

Colour of eggshells: dark brown.

Origin: the evidence is that the Malay originated in South-Eastern Asia, whence it was imported directly to England and where fowls of this type are common. Moubray (1824) calls them Chittagong or Malay, and describes them as an Indian variety; but India meant in those days practically all southern Asia. Dixon (1850) quotes from the 'Penny Cyclopedia' that this is an Indian breed, called by Europeans the 'Kulm Cock', but gives no evidence in support of that opinion. Ferguson (1854) says that the term 'Kulm' is but another name for the Malayan class of fowl, and states 'From the Peninsula of Malay, situated on the southern part of India (Malay is the southern part of Siam, not India - E.B.) where this fowl sill abounds, have been imported magnificent specimens of the Malay kind. To Mr. J. Nolan, of Dublin, a man of great experience and sound judgement, we are indebted for the extensive propagation of this very noble family. He was one of the earliest Malay breeders, having obtained his stock from the London docks, to which place they had arrived direct from Malay. That they were the aborigines of the Peninsula of Malay is unquestionable.' He also calls attention to the fact that they were the largest known fowls until the arrival of the Shanghai or Cochin. Doyle (1854) calls it Gallus giganteus, or large Kulm fowl and says it is found in the Deccan country as well as the Malay Peninsula. This is confirmed by Colonel Sykes (1832) who found the Kulm cock domesticated on the Deccan, but he believed it was there introduced from Sumatra by the Mussulmans.

Author's note: This has the support of Jardine (1836) who reported a specimen of Gallus giganteus in the Edinburgh Museum, said to be wild from Sumatra, of a large size. The reader will find Jardine's account of Gallus giganteus elsewhere in this book.

I followed up this lead of Jardine's and in a personal communication of the 19/8/85 from Ian H.J. Lyster, Deputy Keeper at The Royal Scottish Museum in Edinburgh, Department of Natural History, received the following information.

"We searched through our collection for anything at all that resembled the Gallus giganteus in Sir William Jardine's book, but with no luck. The bird illustrated is very distinctive and I am sure that we have not overlooked it, in either our collection of mounted specimens, or in our cabinet skin collection. There is, however, always a chance that it may turn up, we still have a number of specimens surviving from that date even though the majority from that period have succumbed to the ravages of time. I will therefore keep your letter in front of me for a little bit longer and have another search. We are currently writing up our Type material and anything from the early 1800's is well worth investigating.

Continuing again from Brown: "In a French work (1895) a very wide distribution is given to this race, for it is stated that it is indigenous to the Malay Archipelago, to the Philippine Islands, that it is common in India, in Burma, in the islands of the Indian Ocean and on the eastern coast of Africa. Mr. R. Whitfield (1895) writes: 'Some years ago I had a conversation with one Captain Williams, who told me that he had brought many birds of this breed (Malay) to England, and that he had been all through India and the Malay Archipelago, but saw only a few specimens of them until he reached Singapore, where they were somewhat plentiful. He stated that the birds bred and fought in those islands were principally a shorter legged, longer bodied and feathered bird than the Malay, and would fight like demons; still the Malay was bred and fought largely.' Author's note: The birds referred to here may have possibly been the Aseel which I would consider a close relation to the Malay - It may be accepted that the Malay originated in South-Eastern Asia, and that, when found elsewhere, it has travelled from its original habitat. Further, Mr. C.F. Montresor (1824) says that he believes 'the Malay is no other than a cross from the Indian Game cock and a Chittagong hen', which he has bred on many occasions, and produced several that have been bought in Calcutta by stewards of ships and sailors, and have no doubt found their way to dealers in the neighbourhood of East London and there sold as Malays."

Under the heading of Oriental Game Fowls in THE POULTRY BOOK -- Johnson and Brown (1912) Dr. H.P. Clarke of Indiana in the US writes as follows: "Now having noted the probable antecedent of the Old English, and having observed that a domestic game fowl even such a bird as the Flemish, differs little from its primitive wild type, we are led to the conviction that the present existence of a game Aseel almost certainly indicates that some such fowl as that described by Temminck under the name of Gallus giganteus did once live in the wild state. There are only two real arguments against this theory: one is the fact that all domestic fowls are fertile when bred one with another, which seems to be fully explained by the well known 'Palasian doctrine' exemplified in the feline and canine tribes, viz., descendants of species which, when first domesticated would if crossed probably have been in some degree sterile, become perfectly fertile after a long course of domestication. The other, and the one upon which Darwin rested his belief is the fact that no such wild fowl has ever been found and its extinction he considered an improbable hypothesis, seeing that the four known species have not become extinct in the most ancient and thickly populated regions of the East. But reasoning from analogy, and going upon the theory that Old English Game as closely resembles Bankiva as the Aseel or the Shamo Jap does its own wild prototype, let us try to picture the primitive Oriental. Think of the short wings and heavy build, and consider whether after all it would not be 'an improbable hypothesis' to expect such a wildfowl to survive in the most ancient and thickly peopled regions of the East. Would it not rather have been a matter of wonder if such a fowl in the wild state had failed to go the way of the dodo and the great auk?"

Author's note: As most of us are aware the dodo being a ground bird became extinct mainly by the hand of man himself. Gallus giganteus or Malay classified by Finsterbusch (1929) as a 'runner' or ground bird and not a 'flyer' as is the Bankiva, so was therefore at a distinct disadvantage when it came to survival in the wild.

Again from THE POULTRY BOOK - Johnson and Brown under the heading of "Modern Game Fowl" -The Malay: 'This is one of the best known, though of doubtful origin, of all the domesticated Indian birds; it is more or less the Indian Game cock, varying in size, colour, and habits as it does, from the high breed Aseel to Gallus giganteus. Mr. Weir has shown that the old fighting shakebag was in some instances probably partly, if not wholly what is generally termed a Malay, the name comprehending a large family of bony, tail, sparse, hard feathered, variously coloured fowls. Any tall, large, tightfeathered fowl without wattles, with either a knob, lump or thick made pea-comb, is at once called a Malay or Kulm fowl, though the variations in these are numerous. Consequently, those wishing to gain

prizes at any of our shows must breed them to certain forms, colours, and standard. Although long known in England, and probably used in fighting, we have no drawing or picture of one antecedent to that given in Rees' 'Cyclopaedia' since 1810. In this one sees at once the Malay in England at the time, and with its peculiar form and flowing tail there was but little difference between them and those shown in the early fifties. Marsden observes of the St. Jago cock 'that this bird is so tall as to enable it to pick grain off a common dining table, and that it has the habit when fatigued of resting its body on the hock or hind part of its legs, and in this state is taller than the common fowl.' Latham adds: 'we have not been fortunate enough to see this bird, but that it must be a giant of its race can easily be imagined from the figure of a leg of the natural size sent to Mr. Temminck from Batavia, at the back of which is a tremendous spur, two inches in length, and stout in proportion'. Here we have the habit and leg bone of the Fanciers Malay. Lieutenant-Colonel Sykes in his 'Memoir of Birds found in the Dukan (Deccan) States' states that it is only there met with as a domestic bird, and he has reason to believe that it is not a native of India, but was introduced by the Mussulmans from Sumatra and Java. The iris, he says, of the real Game bird should be whitish or straw colour. (This is the same, or nearly so of the Aseel, and some strains of the Old English Game, and is also the not unusual colour of the eye of some of the imported fowls called Langshans.) The Colonel landed two cocks and a hen in England in June 1831, and they bore the winter well; the hen laid freely, and by September 1832 had reared two broods of chickens. The cock had not the shrill pipe of the domestic bird, and his scale of notes appeared to be more limited. A cock in the Colonel's possession stood twenty six inches to the crown of the head, but was said to attain a greater height. The length, from the tip of the beak to the insertion of the tail, was twenty three inches. Hen one third smaller in size than the male (Zoological Society Proceedings 1832)."

Author's note: The following notes from Johnson and Brown vary a little from Jardine's description given elsewhere. However, I will continue on with them. Jardine's description, with some additions, give the pic at that time, 1836, of the Malay.

In part from Jardine: "It often stands more than two feet high from the crown of the head to the ground. The comb extends backward in a line with the eyes; it is thick, a little elevated and rounded at the top, and has also almost the appearance of being cut off." Author's note: This would be consistent with a walnut comb as is known in the Malay. The genetics of the walnut comb is explained in Book 2 CHICKEN BONE RECOVERIES page 7 (1984). "The wattles of the under mandible are comparatively small, and the throat is bare. Pale goldish reddish hackles ornament the head and neck and upper part of the back, and some of these spiny; from the bare part of the throat, middle of the back and lesser wing coverts deer chromes the webs of the feathers are disunited. Pale reddish yellow, long drooping hackles cover the rump and base of the tail, which last is very ample and entirely of a glossy green" (the description by Sir William Jardine describes the bird before the modern innovation and peculiar fancy of lessening the tails of all our domestic fowls, and thus much of the green is lost as well as the utility of the tail) "of which colour are the wing coverts; the secondaries and quills are a pale reddish-yellow on their outer webs; all the underparts deep black and glossy green, with high reflection. The rich chestnut of the base of the feathers appears occasionally, and gives a mottled appearance to those parts. Such was the description, and from this even as far back as the teens of the last century there were numerous variations, such as tufted, the whiskered, and bearded (as now) besides that of form and habit."

Again from Johnson and Brown: "The following letter from Singapore, November 1823, Straits of Malacca by Beruga Ayam Saborg is of especial interest, throwing light, as it does, upon the whiskered Malay etc. and perhaps on our English muffed Game, and more on the Azeel ... having frequently read notices relative to the Malay and Chittagong crosses which appear to me to be erroneous, as the writers proceed on wrong data. One writer complains of the muffly heads, another the great weight and clumsiness of the Malay Game cocks, which when well bred have very seldom indeed any top knot, and seldom weigh more than four pounds."

Author's note: I would assume the bird referred to in this instance was the Azeel and not the true Malay taking the weight into account. I don't feel there is much doubt that a relationship exists between the true Malay and the Azeel. It will be noted that the fowl discussed is named the Aseel. Herbert Atkinson uses the name Asil (Book 2 CHICKEN BONE RECOVERIES 1984), the majority of poultry writers use the name Aseel. I would suggest these three names are one and the same, not three different breeds.

To continue from Johnson and Brown: "The Jungle cock, which inhabits many of the islands in the eastern seas, is a perfect Game cock, high on the leg, light fleshed, hard feathers, a fine eye, and the most beautiful plumage conceivable: in fact, a perfect Game cock. This bird I look upon as the father of the true bred Game fowls. The Malays frequently secure their eggs, hatch and bring them up, or put them in the way of Jungle cocks."

At this stage before moving onto the recognised Gallus species it is necessary to draw heavily on the work of C. A. Finsterbusch COCKFIGHTING ALL OVER THE WORLD (1929). This is necessary to support and give recognition to Finsterbusch that Gallus giganteus was a species distinct from Gallus Bankiva, Gallus sonnerati, Gallus lafayettei and Gallus varius although Gallus giganteus is not recognised by ornithologists as a separate species.

In my opinion Finsterbusch's study of game fowls rates very highly as he covered the field most thoroughly using a practical approach and supported all his arguments in a very logical manner. He travelled the world seeking information on Game fowl to further his studies which certainly showed up in his writings.



I feel that the opening chapter of Finsterbusch's book entitled "Natural History of the Cock" is well worth quoting in full here as it is to me most important when discussing the progenitor of the Domestic Fowl and explains the situation with regard to the Malay when considering it as a separate species to the Bankivoids.

I reiterate, as I have often done in my previous writings, that extensive ongoing study must be done on any chicken bone recovered, for if this is done, I am sure that the claim of the different species being involved can possibly be resolved. Later in this chapter I will again lean on Finsterbusch wherein he explains the differences in detail that exist between the Malay and the Bankivoids. So here I quote Finsterbusch's opening chapter.

NATURAL HISTORY OF THE COCK

"The domestic fowls, known in the whole world by numberless varieties, may justly be divided in two large groups: Game and Non-game Fowls. It is queer that breeders of either group look at the other with a certain disdain and while the utilitarians look upon the Game birds as a sort of nuisance, the average game breeder classifies any other than Game fowl as 'dunghills' and does not feel for the same any sympathy other than that connected with the cooking pot.

It has been stated time and again that all domestic poultry is descended from the Gallus Bankiva*, but close study of this subject proves this hypothesis to be wrong. In fact, there is no acceptable reason why, if the Bankiva has been tamed and domesticated, the other wild varieties should not have undergone the same procedure. There are tolerably good reasons for believing that this was done, as we shall learn in the proceedings of this treatise.

Science recognizes four different wild varieties, still extant in their natural haunts, viz.:

GALLUS FERRUGINEUS (Bankiva). The red jungle fowl. It is found in wild state all along South the Himalaya, India, Siam down to the Sunda Archipelago.

GALLUS SONNERATI. The grey jungle fowl. A particular inhabitant of Southern India or Deccan.

GALLUS LAFAYETTEI. The specific variety of Ceylon, and

GALLUS VARIUS, the interesting jungle fowl of the Dutch East Indies."

* All dunghill poultry books follow this old idea but modern scientists do not. Note this extract from a letter to the author written by E.C. Stuart Baker, Hon. Secretary of the British Ornithologist's Union: 'I am in full accord with your opinion that Linné's Gallus gallus (Bankiva) can not be maintained as the parent of all domestic stocks. I think with you that the Grey and Ceylon Jungle fowls, as well as others, have at one time or another had some influence on them.'

"Of all these varieties the Ferrugineus or Bankiva is geographically the most extended. variety, being found not only in India, but also in Siam, Malaya, Sunda Islands and the Philippines. As such, it appears to have been domesticated in much larger numbers than the other species, and consequently its type has been evident ever since in overwhelming proportion. No doubt that this fact has led so many excellent naturalists to the erroneous supposition that it is the ancestral form of all domestic poultry. That this, however, is not so, we shall endeavour to explain in the following lines.

GALLUS GIGANTEUS (Temm.) - There is no doubt that the common domestic fowl known in Europe and bred for centuries as barndoor or game-fowl is seemingly conspicuous of Bankivoid type and characteristics. Besides these however, fowls of large size, with feathered shanks, showing a marked deviation from the traditional Bankivoid type, were known as Asiatics or Mongolics. Nobody could account for their existence until the tolerably pure ancestor was discovered in the East scarcely a century ago, and later identified under the name of Malay, from the descendants of some Oriental birds of this group imported into Europe from Malaya. Since then, it has been a matter of speculation, whence this awkward, gigantic fowl descended, and though many authors consider the Oriental giant a mere variation of the common Bankivoid domestic fowl, no sincere student of the Gallus species can be convinced that both Bankiva and Malay hail from the same source. They are radically different, mentally and physically.

The above mentioned error being due to the fact that most scientists, though fairly familiar with the barndoor fowl of Europe, show surprising ignorance regarding everything connected with the other group of domestic fowl identified as Game-birds, and most, if not all, fairly pure. Oriental or Malay cocks have decidedly been bred during countless centuries merely for fighting purposes. As such they were not usually found roaming about as dunghills, but kept studiously confined and out of-the way. Explorers and authorities on the Gallus question, such as Temminck, at once were impressed when they saw the first specimens of these queer birds, that they were glancing upon the representatives of a nail species, yet unknown to Western science. Giant size, scantily feathered, long and heavily muscled legs, remarkably short in wing, these birds resembled, as the ostriches, specimens that were too heavy to fly, and subsequently adapted themselves to a new life where they could develop those characteristics that have ever since identified them. Their enormous size warranted the name Temminck accorded them, viz. Gallus giganteus. Science opposed this and failed to recognize it as a distinct variety for several reasons that have not proved to be convincing, beyond the statement that a wild ancestor corresponding to this type has never been found, nor are there any records of an extinct like variety.

If we consider, however, that the possible habitat of the original wild Malay is scarcely known to Europeans since the 15th century, that a giant dove relation, the dodo (Didus ineptus), was radically exterminated also and that the Malay shows all traces of being domesticated since many centuries, we come to agree that the above statement proves nothing. The Malay (wild) cock must have been exterminated long before any European showed up in the Orient, and as preserved to our days in a

domesticated form, and this, besides, only kept -- as stated -- for the pit. There are reasons for believing that what we know as Malays today are only remnants of the birds of yore and that genuine, pure birds are extremely rare, even in the Orient. Yet, the fundamental type has been reproduced with such a marked prepotency that there should be but little difficulty in picking up fairly true breeding stock.

While descriptions of the wild Galli, bankiva, sonnerati, lafayettei and varius, may be found in almost every work about Ornithology, the Malay has been left out, a reason for quoting its characteristics herewith.

TYPE & SIZE: The body is peculiar and unique in shape and carriage, and the Malay, contrarily causes the impression of wanting to duck under or hide. This is not casual, as the Malay is a runner, while other Galli are decidedly flyers. Consequently both have quite different modes of living and logically different anatomy. The body of the Malay is rather short, very strong aft, extremely broad at the hips and narrow between the shoulders. The breast is flat and broad, lacking the depth of flyers and their strong pectoral muscles. The wings are very short and unable to lift the heavy body. The legs however, from their insertion in the hip to the strong hocks are heavily muscled and extremely powerful. Nature has provided that the corresponding bones, being of generous proportions, should give greater surface for muscle insertion by means of rims and protuberances that are unknown to pure Bankivas, whose bones are smooth and light. The Malay's bones are not only filled with marrow, but are stayed inside, with the well-known spongy reinforcement. The muscle distribution of hips and legs, and the corresponding skeletal portion is so arranged as to produce the most convenient angles for power exertion, giving the bird a slight roach aft and a drooping tail, characteristic of the Malay. Weight being localized aft, the breast is drawn flat and broad, forming and ideal base for the extremely long and strong neck which is inserted well under the wings and low. The neck rises with a sharp curve upwards forming at the extreme a broad, powerful base for the head. This is also peculiar. Very broad at the jaws, the eyes are protected from above by overhanging so-called beetle brows, and from the side by prominent cheeks. Upper and lower mandibles close tightly and boxing, forming a curved beak, massive at the base and short. The ample base of beak and broad jaws allow a wide gap, so as to enable the bird to swallow big lumps. Correspondingly, the gullet is very ample, and a large dewlap completes this outfit. The crop, however, is small, as is the proventriculus and gizzard. The digestive tract is short, and far from being so elaborate as that of Bankivas. Shanks and feet, fairly large, massive and strong. Excellent organs for running and scratching, but scarcely adapted for roosting on thin branches.

HABITAT & FOOD: The enormous size and weight of the Malay, reaching 24 inches, and weighing 14 and more pounds, would demand very ample and powerful wings to alight and fly, and therefore instinct and adaptation placed him not in the forest, where the trees would be useless to him, but in the grass jungles where the huge bird can hide perfectly and push his way forward, aided by his strength and weight. Under these conditions the delicate single serrated comb of the Bankiva would soon come to harm and the after-blade would entangle with the grass. Not so the Malay comb, which is a sort of hard elastic cushion, fairly smooth and broad. Here we find an explanation for the beetle brows also. They being intended to serve the same purpose, protecting the delicate eyes. The face and upper neck of the Malay is covered with bristles. Earlobes and wattles very small and tough. The strong neck, flat breast and peculiar shape of body are excellently adapted for this habitat, while the weight and power is a primordial condition for romping a way through the tangle. Here we find also a reason for the scant and extremely hard feathering of Malays. While the flying bird has long and soft feathers, long wings and tails, these would be a decided hindrance in the grass jungles of the Malay. When Bankivas are frightened, the male alights on a tree, but the lesser feathered females, with short or scant facial appendices, hide in the brush. An observation that confirms the feather peculiarity of the more or less henny-feathered Malay. In their natural haunts, birds must find their food. The Bankiva merely turns the leaves, but does not dig deep holes. His leg power would not suffice for this purpose, as the toes are long and thin, well adapted to roost on trees, but not for scratching. Therefore it feeds on seeds, fruit, leaves and what he finds on the surface of the ground. In the grass jungle, the Malay will hardly find the same conditions. Young sprouts in the spring, and seeds in autumn, that would be his vegetarian menu. During the rest of the year, however, the Malay must hunt for something else. Here the broad gullet comes in handy. Crabs in the swamp, frogs, lizards and insects, even snakes, for which, even through a long course of domestication they show a marked preference. When insect and amphibian life sleeps, the Malay is able to search for food, digging deep holes, and we have conducted experiments showing that they really do this work perfectly, while Bankivas would have starved. The small crop, gizzard, short and tough intestinal tract of the Malay indicate carnivorous habits. Would he be confined to vegetal food only, the apparatus would not suffice to supply the body and he would become stunted. This is a probable explanation why, besides the giant strains, dwarfed ones have been produced in domesticity.

HABITS: Though, as stated before, the Malay must have been domesticated some thousand years ago, they still show some traits and proclivities pointing to their wild ancestors. One of these is their marked inclination to dig deep holes, even when not forced to do so by hunger. This may be observed especially when walking fowls in the open country or garden, when Malays will never err digging and scratching at the roots of bushes where they diligently pick up minute morsels. On examination it was found that their crops were filled with insect, frog and other little eggs, besides heaps of larvae. It is also interesting to note how they behave when frightened. Bankivas usually resort to a run for home, Malays stoop motionless with head inclined towards the point of menace, and when running in a patch covered with plants and grass, they generally turn left and right and hide. Not so when on open range, while the Bankiva will take to wing and alight, the Malay runs straight forward, seemingly slow but nevertheless quick enough for an average man. His run is always toward the next thicket, which he spots with amazing rapidity. There are reasons to believe that the original wild Malay was fairly monogamous, though not of solitary habits. In confinement, his inclination to favor a single hen as mate is a general drawback in the breeding pen. As soon as this particular hen becomes broody, the cock will mate with another hen of the same flock, and so on changes mate as circumstances demand. It is a well-known fact that pugnacity of cocks increases in the breeding season. We have observed that Orientals kept in natural conditions lay well the whole year round at intervals. Typical Malay hens we had under observation laid five, seven and eight batches of eggs in the year, all of which proved fertile. Aseel hens, that were ever since reputed as the worst layers, laid four batches under such conditions. Many friends who could afford land enough kept Malays under observation with identical results. This winter laying, for which Malavoids and Mongolics are known, would necessitate the services of the cock constantly, in consequence the cock must be sexually fit the whole year round and as such shows high pugnacity in all seasons. This is effectively so and they do not seem to lose either pugnacity or gameness for a single day, not even through moult, which is effected slowly during the hot season, sometimes taking as much as five months to complete. In fact, it has been observed that during the whole year round it is difficult to pick up a Malay not showing pin-feathers and others in the process of completion. All these characteristics may possibly prove different in extremely cold climates or where the stock is not pure, but in sunny countries this is a positive fact.

The pugnacity of all Galli is proverbial. What the average breeder does not know, however, is that the fighting spirit is a secondary sexual expression, caused by testicular secretion, and that this influences not only the mental, but also the physical means of combat. We know that deer that have been injured in one testicle show abnormalities in their horn branches and when emasculated do not grow horns. The relation between the sexual glands and the male's means of combat is at once apparent. Pheasants, turkeys, peafowl etc., that are related to Galli, have weapons like these i.e. natural spurs. It is queer to observe the spurs of the Malay. Set fairly low, thick at the base, they grow straight and pointed downwards. High and upcurved spurs, such as those of Bankiva, would cause the cock to entangle continually in the grass, but such that are pointed down allow the grass to run past swiftly. Spurs are generally only indicated on the females, but spurred game hens are conspicuous in breeds where the cocks carry very large and curved spurs, such as all flyers do. The gameness, pugnacity and strength of the Malay has induced cockers to cross him on native fowls with a view of improving their fighting ability, and subsequently through centuries of experimenting many varieties have been produced giving rise to the numberless breeds of domestic poultry, both dunghill and game.

EVIDENCE OF ORIGINALITY: While breeders and students of Oriental Game fowl are thoroughly convinced that they are descended from a different -- now extinct -- wild ancestor and quite unlike the traditional Bankiva, many authorities, both on game and fancy poultry, are prone to believe that the Malay is only one of the multiple variations due to domestication. One of the proofs quoted against the originality of the Malay, and upon which the great Darwin had based his statement is that 'no such wild fowl has ever been found, considering its extinction an improbable hypothesis seeing that the four known species have not become extinct in the most ancient and thickly peopled regions of the East.'

Now these four known species are 'flyers' as stated before, while the Malay is not. We have further considered his grass jungle haunts. The wild fowl of India is extremely shy. Even the dunghill Bankivoids are shy. But the Oriental or Malay is confident and tame in disposition. Apparently no man was able to run a Malay down nor could he well approach his victim, as the Malay has too sharp eyes and ears to grant any success. But hunted with dogs and driven out by fire the Malay soon became helpless, being unable to fly. As to its extinction, we have a similar case from historical date. The Dronte or Dodo (Didus ineptus) of the group of the doves, unable to fly, larger-than a swan, gray with yellow wings and tail, both atrophied: feet short, strong. Extinguished at the end of 17th century in Mauritius. A near relation of same the Solitair (Didus solitarius) the size of the goose, lived in the island of Diego Rodriguez, in the Indian Ocean and some 300 miles from Mauritius. Think how both extinct species were related to the doves as the Giganteus or ancestral Malay: was to the Galli. As non flyers they were easily extinguished. It is improbable that both Didus were not to be found, before the advent of the white man, in ether islands also, yet it must be denied because there are no records. Non-flyers were easily eradicated in the densely populated regions of the East, and if the Malay was saved, it was only due to his marked tameness towards man and its utility to provide diversion. Another argument is emphasized on analogy in domestic fowl, seeing that the multiple breeds known as Asiatics, Americans, Mediterraneans, etc., all show marked variation between each other. Some have single, others rose, and others pea combs. Some are short, others long feathered, etc. This variation is supposed to be strong in all living beings. The argument has a weak point, however. We know that the Malay has been crossed on Bankivoids in different degrees of blond percentage. In China this cross has produced the Mongolic breeds, as nobody will doubt who knows the Red Canton fowl, almost identical to the Rhode Island Red. And these Rhode Island fowls have been produced mating-Red Malay cocks with the barndoor fowl of New England, USA.

There are many grade Malays in India of the same character, the Chittagong for example, whence the English Exhibition Malay is derived. But if those crosses would not have been effected, lacking the Malay, it is probable that the Chinese fowl would have assumed the character of the Mediterranean, which on the other side, are examples how far the Bankiva can and will variate when bred pure.

As will be shown further on, the Persian cock, the Egyptian, the Greek, Roman, Italian, Spanish and English Game, are the course of one evolution, that proves again how far and wide variation is reasonably possible. But just how from a Bankiva, a giant five times as large, with completely different anatomy and physiology, as described above, may be expected the vary, is a statement that claims-for scientifical demonstration. Variation and evolution-are possible within the limits of the breed or species. It may assume the form of enlarged size or capacity, change of color, adaptation to climate etc., but it will not trespass the well defined boundaries of inherited ability. The skeleton will not change nor will the internal organs up to a degree that marks a profound difference between the Bankiva and the Malay. Most European breeds tend to revert to the original Bankiva, and this is set forward as a proof of origin from that source. It is also a well established fact that crossbred Malays tend to revert also to their original type, with such prepotency and marked tenacity that we take this very important item as convincing proof of the originality of the Malay type. Game breeders know this well enough. And besides Orientals, even crossed, never revert to Bankiva. We do not believe that besides the Malay, only the Bankiva has ancestral rights to our domestic fowl. The color of Sonnerati, its comb and other peculiarities show up pretty often in Game fowl. It has been stated that the Sumatra Game fowl is a cross production between Bankiva and Malay, but the more we see of them the farther we get from the point that the Bankiva is the sole ancestor of domestic poultry. Apparently and with all probabilities, all wild jungle fowl have been used now and then for crossing, and if the Bankiva type and color is evident in the progeny in a higher degree it is merely due to the fact that its wide area of distribution has caused people to use it in proportionate degree also.

We have examples of how the Bankiva is capable of variation under domestic conditions in the old fighting breeds of Europe. In Italy, the former game birds degenerated into birds that lost the color and hatching instinct. In Spain and Mediterranean Islands, several breeds evolved from the game birds of yore, yet others were kept pure, and the Spanish fighting cock of today, where kept pure, is as pure Bankiva as the Game fowl of Rome, Greece and Persia. It has not changed, neither in type no size. In the North of France, departments of Nord and Calais, the Bankiva has attained large size, three times that of Spain, yet has not changed in type and characteristics. Still larger are the game birds of Belgium,

the Flamand and the Liégeois, while the Bruges shows decided Malay cross. It is an open question if the larger breeds of Belgium do not carry traces of Oriental blood, but in the main they are fairly Bankiva in type. The Game birds of Ireland, reputed for their quality, are tolerably pure in blood and do not differ fundamentally from their ancestors of Persia, yet they are variated or should be in more than 20 centuries of domestic life.

Why did or do not tolerably pure Bankivas vary, even approximately, towards a Malay type? And why in the Orient should they have done, when there they have been submitted to the same selection for the pit? Why does Malay blood in the East show up in the progeny with so marked tenacity, for numberless centuries?

We find but one explanation: The Bankiva type is perpetuated through so many generations for the same cause as the Malay does. Both are originally pure, and from different wild ancestry.

THE FLYER AND THE RUNNER - May I digress slightly and ask the reader to turn back to the tracings of sketches by Mark Marshall, who together with A.J. Compton would have to be considered the two most learned poultry authorities we have had in Australia over the years. As well as knowing their fowls they were also poultry artists. A.J. Compton's AUSTRALASIAN BOOK OF POULTRY (1899) and Marshall's KING OF FOWLS (1958) are regarded as classics of poultry literature in Australia. These sketches of Marshall came from the weekly paper "Poultry" (1922) published in Sydney. Why I have reproduced these drawings is to stress the point that it can be readily observed that both the Australian Game and the Modern British Game show definite characteristics of the Malay.

Let us first consider the Australian Game which originated in Australia and in the first instance stemmed from a breed called the Colonial Game. However it has been bred as the Australian for over 100 years. To substantiate this I have in my possession a copy of the original standard, including line drawings of both male and female drawn by a leading bird artist, Neville Cayley. This standard was originally published in the "Sydney Mail' in 1889, although drawn up in 1883. That standard for the Australian Game Fowl differs very little from what we breed today. So after 100 years of breeding the Australian Game shows no sign of reversion whatsoever to the Bankivoid type.

The Modern British Game is also bred in Australia, although not in large numbers. Here again I can see no reversion to the Bankivoid type. Only recently (1935) I was fortunate to have the opportunity to view the private art collection of Mr. William Bowmore of Newcastle, NSW, which is possibly one of the most comprehensive private collections of this nature in the world, covering a wide range of artifacts. Amongst these artifacts was a 10th century Persian ceramic plate, perhaps 12 to 14 inches in diameter; depicted on it was a Modern British Fowl which in shape would have done justice to any fowl of the breed on-the show bench today. I would suggest this proves a point that Gallus giganteus was domesticated and descendants of it were present well before the 10th century AD and had spread to Persia by that time, although as far as I can ascertain nothing was recorded in South-east Asia.

I feel these instances further lend support to the hypothesis that there was another species, Gallus giganteus back there in the past, and when the Malay blood has a strong infusion as it does in these breeds no sign of reversion to Bankiva becomes apparent. I have personally great regard for the writings of Finsterbusch and would recommend that anyone engaged in the study of the origins of the domestic fowl obtain and read his book in full. They will be well rewarded. Although original copies are perhaps hard to come by, COCKFIGHTING ALL OVER THE WORLD is now available as a reprint in Australia. Although Finsterbusch's interests covered the field of Game fowl and not that of the Asiatics (Cochin, Brahma, Langshan) I propose to take the issue one step further and put forth evidence that the Asiatics were yet another species. Here I will need the assistance of Palaeontologists and Anthropologists who unearth material in their digs and do further study on the bones etc. recovered.

I have endeavoured throughout the illustrations produced in this treatise to emphasize the differences in the makeup and appearance between the Bankivoids, Malay and Asiatics. Even without further evidence I believe the differences are as the old adage states: "They are as different as chalk and cheese". However it is for the reader to either agree or disagree with my hypothesis.

Once again let me quote from Finsterbusch page 118: "Here is another point of differentiation between the Malay and the Bankiva. The first is an extremely heavy strong bird, with frame adapted for a runner, while the latter is a light framed flying bird, that appears larger and stronger by profuse feathers it wears. The dunghill man says that the Oriental cross is coarse while the Bankivoid is fine fleshed. Such

difference constitutes the most typical marks of diverse origin, as they correspond to natural adaptation of the birds and as they only are observed in cross-bred barndoor fowl, in the laboratory of the investigator, have not given material for scientific differentiation. They are dealt with, simply, as coarseness or fineness, but not appreciated as what they really are, different marks of birds, with different origins. The skeleton is composed of different classes of bones: tubular, flat and short ones. These are formed by the outer bone tissue and the inner, spongy, marrow containing structure. We have pointed out already that the tubular bones of flying birds are hollow and filled with air, while those of runners are filled with bone filaments surrounded by plenty of marrow. Such tubular bones are those of the legs and wing, which are by far the largest and the strongest. Flat bones, such as the breastbone, ribs, shoulder and hips are intended to form cavities or containers. The most interesting of these being the skull which holds the organs of intellect and fundamental senses, brain, eyes and ears. Taste and smell are only of secondary importance and consequently their organs are rather poor. Short bones, but very thick and strong are those that form the backbone. They are bored to hold the spinal cord, which widens considerably at the lumbar region, so that in pre-historic animals it constituted a secondary cerebral centrum. In game cocks this "loin brain" is of considerable importance as it influences the action of the legs. It must be protected by strong bones, which can be felt just behind the hip centre. The main substance of the bones is a cartilage that yields glue, impregnated with phosphoric lime. The nutrition of the bones is effected through a cuticle with nerves, and vessels enter the bone through diminutive orifices, carrying the substances that keep them growing. The marrow or medulla is a greasy substance that keeps the bones elastic. It is interesting to note that GALLUS MORIO or black Mozambique cock of Buffon, was so entirely black, that even the medulla was black as ink. As the intestines were white, it is easy to deduct that the black colour was carried in the blood."

"In some birds the feathers are long enough to cover such bare areas as in Sumatras and Bankivas, but in Malays the feathers are usually so short that the skin is shown bare and reddened between the feather: fields. In fact, this is a characteristic of the Malay, which produced a freak variety that is bare on large sections of breast, back and neck. Malay cocks have a very tough skin; Bankivas less so and the Sumatra rather delicate. The skin is strictly adapted to environs and use, the harder the wear, tougher it becomes. Accordingly to this are the feathers which are products of the skin."

"We have said already that the Malay was a bird dwelling in thickly covered grass jungles, and this is apparent at once when we observe that their sexual feathers are notoriously scant and short. In such semi-dark thickets, it would be rather superfluous to exhibit bright colour hues and consequently the Malays are rather dark. Differently the Bankivas that dwell in full daylight and which are brightest coloured cocks that we know; excepting the Varius of which we know very little, and which is similar to the pheasants. Feathers are changed once a year during moult, which takes from one to one to three months to complete. While this process is a delicate affair in long feathered birds - that take care not to injure the pins - it goes on very easily in Malays, which seem to be able to moult at least during six months of the year. Malay birds picked up from the yards at any time of the year, always show plenty of pin feathers during the first three years of their life. Later on they moult in short time."

"Flyers have a long and elaborate digestive trait while Malays have short guts and of very tough tissue as explained elsewhere. Bankivoids have excellent day eyes but their ears not so sharp. Malays go to bed later, being able to see in the dusk, but have not so good day sight. Instead, they have very sharp ears and usually take a notion by acoustic means before they have any chance to see the source of certain noises. Again here is a difference between the nervous Caucasian and the tranquil Oriental; the latter seeming less affected by a rival."

Finsterbusch's chapter "Fundamental Differences in Malays" opens as follows: "As the traditional Caucasian game cock resembles closely its wild ancestor, the Bankiva, so the average Oriental or Malay game must bear some resemblance to the much discussed Gallus giganteus. We agree that the species Gallus is liable to variation under long centuries of domestication, but bear in mind that this variation must be logically circumscribed to intrinsic ability. That is to say, a Bankivoid will normally vary within the possibilities of the species. It may suffer the effects of mutations, or violent changes, as evidenced by spontaneous production of rumples birds, five toed, leg feathered and albino coloured specimens, but it will not acquire the characteristics of a bird that is fundamentally different, such as the Malay. Many authors, otherwise well versed on domestic fowl, will not agree that a Bankiva and a Malay have sprung from totally different wild sources, arguing that the numberless varieties of barndoor fowl are

comprobants of the variability of the species. This statement however, in so far erroneous, as there would probably not exist such varieties, if both elements, Malay and Bankiva blood, would not have mixed to this effect. It is probable that the Gallus giganteus, progenitor of the Oriental or Malay fowl became extinct long before historical time; whatever is left in domestication is nothing but remnants of a highly interesting and doubtless, very useful species of bird. Our firm conviction, as a logic consequence, is that the Malay or Oriental is different from the Bankiva, fundamentally. That is to say, it does not differ only in some points of type, but is a different species altogether, and doubtless descended from the wild, extinct trunk identified by Temminck as Gallus giganteus."

To conclude Finsterbusch's quotations let me leave you with this from page 58: "The skeleton of Orientals again shows a marked difference, while the Bankiva, as most flyers, show hollow, pneumatic bones, those of the Malay, especially in the legs, are filled with marrow and reinforced laterally by spongy bone structure. All bones of the Malay are naturally strong, a fact at once remarkable in the skull, which is heavy and very hard. The enormous thighs are heavily muscled and the bones show excrescences and ridges that materially strengthen them primarily and besides give a larger surface for muscular insertion. The bones of the Bankiva are light and smooth."

I could go on quoting Finsterbusch as his study and hypothesis on the Bankivoids and Malay being different and distinct species for there appears no end to the facts he brings forth to support the argument. He leaves no doubt in my mind that his findings are correct and I would expect any student of ornithology would also agree. Whilst I agree with variation, especially under domestication which is proven by the mixture of various breeds of poultry that exist today it does have its limitations. Mutations can also occur but I think also that has its limitations. Let us also consider the situation in this light. With all respect to Charles Darwin, he designated Gallus Bankiva as the sole progenitor of the Domestic Fowl. However, he and other poultry writers of the 19th century did not have the benefit of Gregor Mendel's papers on inheritance, which ironically were first published around the same time as Darwin's ORIGIN OF SPECIES.

By some quirk of fate Mendel's paper was pigeon holed for some 40 years and it was not until around 1900 when De Vries, Bateson, Punnett and others unearthed them and realised their value. I feel that Darwin, had he known of Mendel's experiments and findings in the field of genetics may have made very good use of them. Darwin, as far as I can discover, offered no explanation as to what Gallus Bankiva evolved from during the evolutionary process. What was the progenitor of Gallus Bankiva?

On the other hand we have no evidence either as yet of the progenitor of the Malay. Hopefully the anthropologists, palaeontologists will turn something up in both cases. Sumatra or Java may be a possible for the Malay as from evidence it existed in its wild state in that area.

Information from a friend of mine indicates that at this point of time (1985) that diggings are proceeding in Java. However it appears to be difficult to obtain any information from this area. We therefore can only hope that the scientists in the field will find something and identify it, perhaps throwing some light on the progenitor of Gallus giganteus which would give it the status of a separate species of Gallus.

Finsterbusch's definition of the Bankivoid being a 'flyer' and the Malay being a 'runner' would be a statement of fact, for anyone conversant with the Malay would have to stretch the imagination more than somewhat to consider it as a flyer. It could be nothing less than a 'ground' bird, thus making it most susceptible to predators, both man and beast.

To support Finsterbusch's deliberations on bone structure of the "flyer" I would refer the reader to FOSSIL BIRDS - W.E. Swinton (1965) page 13, and quote as follows: "Strength and rigidity are, however, only two of the most important requirements of the framework of a successful flying machine. A third character of equal importance is lightness. In aeroplanes this is achieved by using light metals and in birds by reducing the amount of bony tissue to the absolute minimum. Bird bones are remarkable for the extreme thinness of their walls in comparison with their great mechanical strength. But this is not all the cavities that in most animals are filled with marrow are in most birds occupied by delicate membranous sacs filled with air; so the weight of the marrow is saved and, because the air sacs are outgrowths from the breathing apparatus, the bird carries within itself reserves of air that play a vital part in the physiology of flight. The oldest known bird, Archaeopteryx, is an exception to the general rule, for its bones have the normal reptilian structure. On the other hand, the pterosaurs had fragile

hollow bones similar to those of birds, and show, therefore, that this character has been evolved independently at least twice, since the birds and the pterosaurs are not directly related. How extensive this system of air sacs can be in birds is well exemplified by the Albatross, in which every bone in the skeleton, apart from the shoulder blades and the hyoid apparatus, is pneumatic."

Unfortunately I do not have the same supportive evidence on the bone structure of the "runner", the Malay, so that at this point of time we must take Finsterbusch's word for it. I have no reasons myself to disbelieve him. Perhaps the extinct Dodo (Raphus cucullatus or Didus ineptus) of Mauritius, the Elephant Bird (Aepyornis maximus) of Madagascar, Moa (Dinoris maximus) of New Zealand, all being "runners" would probably have much the same bone structure as Gallus giganteus as outlined by Finsterbusch. Therefore at the moment we must leave it at that and continue on.



FIG. 25.—BLACK SUMATRA. Bred by Mr. F. R. Eaton, Norwich.



FIG. 24.-WHITE ASEEL COCK.



Jardine's Gallinaceous Birds

The following text and plates were taken verbatim from The Natural History of Gallinaceous Birds - Vol.1 by Sir William Jardine Bart 1836 and published by W.H. Lizars of Edinburgh. It will give the reader an idea of what was known of the Gallus species at that point of time (1836),

It is unfortunate that the plates could not have been printed in colour as they are in the book itself. Although I am not an authority on art, in my opinion the original art work in Jardine's book is superb as I believe the colours of the plates were painted individually by hand in watercolour and now after 150 years are still top quality.

This is probably amongst the earliest accounts and drawings of the Gallus species published. Gallus lafayettei (the Ceylon Jungle Fowl) is not represented, nor is a drawing of Gallus giganteus (Malay). However these are presented elsewhere in this book.

NATURAL BISTORY of PEACOCKS. PHEASANTS

&c. &c.



EDINBURGH. WHIIZARS. LONDON. SAMULL RIGHLEY 52. FLEET STREET. PUBLIN. W CURKY JUW & C?



* ALLES TELEVATES The back Second Second



GALLUS SONNERATI





THE BANKIVOIDS

We can now turn to the Bankivoids, the term Bankivoid I have adopted from Finsterbusch. I have again drawn on some of the earlier authors for their descriptions which I feel is relevant to this study. As I have been researching the subject for some 10 years or so, I began by making contact with numerous institutions in Asian countries and from-these sources some very useful information came to hand. I will quote the personal communications I received from these institutions as well as the information they sent me regarding the different species of Gallus.

I am also quoting Sir William Jardine (1836), Sir Edward Brown (1906) and others as well as using drawings from these works in an endeavour to give a complete as possible picture of these species. To simplify the situation I will not split up Jardine's work into different sections for the species. I will leave it as it is. as a complete unit.

First of all once again from Finsterbusch, page 395, where he remarks that in all the official communications he received there was no mention of the typical Sumatra and Java wild 'Ayam Alas' or 'Gallus varius' which is a specific Sundaic fowl. Finsterbusch says: "We have referred to it elsewhere and need not repeat the statement The Varius, either intermixing with the Bankiva in the wild state, which we find very problematic, or bred to domestic Bankiva hens, has produced a hybrid species which was to be found wild not many decades ago or otherwise became feral. We cannot refrain to reproduce here a chapter as it appears in the Spanish work, 'Historia Natural', based on Buffon and other writers, edited in Madrid, Spain, by Gasper y Roig 1854. The Brassy Cock, Gallus aeneus. (Cuv. Temm.): it was discovered by Mr. Diard in Pitat-Lanoago, in the neighbourhood of Beincouleen (Benkoelen) in Sumatra, and the specimen represented by the Dutch naturalist and preserved-in-.the galleries of Paris is, according to Mr. Temminck, the Ayam barugo of the inhabitants of Sumatra. This cock has a big comb, smooth on its edge and has two small appendices in the commissure of the beak, having a completely bare throat; the feathers of the neck are fairly long, though less so than in Bankiva or the domestic cock, and rounded at the points. A bright green with purple metallic luster may be seen on his head, neck and saddle hackles. All those feathers are fringed with velvety green. Black, fringed with purple and violet covers the neck, breast, and all inferior parts. The long feathers of the back and wing coverts are tinted vivid purple and spangled broadly with red bows. All other coverts, and the tail feathers are purplish with metallic sheen according to the reflections of light. Shanks and beak of ashy brown. Feet armed with robust spurs. This cock, the females of which we have not had, frequents the boundaries of the large swamp forests of Sumatra. The Gallus Aeneus is known to be a hybrid of the Varius and has been produced in confinement in London and Antwerp; but all experiments to produce a Sumatra have proven failures. Most of all wild fowl and hybrids from Sunda are gorgeously coloured and it seams incredible that the all black Sumatra should have bean produced by mixing such joyously coloured specimens. This, however, is not the most striking feature, it is decidedly pheasant type and fighting traits that make the Sumatra an outstanding specimen among all breeds of fighting fowl. And that the Sumatra existed, pure and perfectly game, nobody can deny. Block Game and Sumatra were introduced into India, where carefully or accidentally crossed, it finally contributed its share towards the production of the most perfect fighting fowl of the world, the Aseel. Nobody can say in which proportion the Sumatra was used, but probably in a very small dose and that the breed survived up to our days is a credit to both the paternal factors of the breed and the breeders that produced such a marvellous bird."



Distribution of the Jungle Fowl in southern Asia (modified from Delacour 1965).

This map came from chapter 42 by Professor R. D. Crawford, University of Saskatchewan, Canada, in EVOLUTION OF DOMESTICATED ANIMALS, Editor I.L. Mason 1984. It is most probable that further modification will be necessary in view of the fact of recent recoveries by Zhou in Northern China.

An illustration of the Sumatra Game from Finsterbusch is included in this treatise. He refers to Gallus sumatrensis after having received a visit from Mr. Henry Van Oordt around 1927/28 who had just obtained reports concerning this species of Gallus from the Netherlands scientific authorities, Buitenzorg near Batavia, Java. Finsterbusch quoted all the correspondence received regarding this Gallus species from numerous authorities.

However, after his summing up the evidence it was not apparent whether the Black Sumatra Game was in fact a wild species or of a feral nature, and no real conclusions could be arrived at.



The area covered by the above map could prove important when tracing the origins etc. of the Gallus species. In the text you will find reference to Sumatra and Flores. To the east of this area chicken bone has been recovered at the northern tip of New Britain. If other archaeological evidence could be discovered in the form of bone or artifacts from the area some light may be thrown, with ongoing study of the evidence, on the species of Gallus which in earlier were present. We are told that the Jungle Fowl existed as far east as Flores and Gallus giganteus possibly was present in Sumatra. Further positive evidence would be an advantage.

GENUS GALLUS - BRISSON 1760

Modern ornithologies have properly separated the birds generally known under the title of Cock, from the Pheasant, with which they were formerly united, and have restored to them Brisson's more ancient title of GALLUS. Thus restricted, they are distinguished from the pheasants, by the crown of the head being naked, and the skin being raised into a fleshy elongation, called the comb, assuming different forms in different species, and by the base of the lower mandibles having fleshy lobes or wattles, by the tail being generally carried erect, composed of two planes folded together at a sharp angle, and in the males having the centre feathers elongated, and falling gracefully over the others. The feathers of the neck, and lower part of the back and tail-coverts, assume a particular form, and are either long and hackled or truncated; in either state they are very amply supplied. They are all natives of India and her islands, frequenting the forest and jungle. They are polygamous, and very pugnacious regarding their females, proclaiming their victory and prowess with a loud and piercing voice. The plumage of the males is brilliant, of the female dull and unobtrusive, and there is often a considerable disparity in size. It is from these birds that we are indebted for the domestic poultry of our farm-yards. Many native species are at the present time known, and we consider it very difficult to determine which is the direct origin of our reclaimed fowls. They may have reached their present state from a mixture of many, but with Temminck we are inclined to give the preference to two species, the Gallus giganteus and Bankiva, both natives of Java, on account of the domestic females bearing the greatest resemblance to those in a wild state, by the similarity of the form and structure of the feathers and by the males of those possessing the greatest development of comb and wattles. The first of these birds may be now described.

GIGANTIC COCK - GALLUS GIGANTEUS - TEMMINCK

The description of Coenraad Jacob Temminck is founded upon the notices which have been given by Dampier and Marsden, the only portion of the bird which he had seen being the leg and foot, of which he gives a plate in his Natural History of Gallinaceous Birds. There is a specimen in the Edinburgh Museum said to be wild from Sumatra, of a large size, and to which, in several particulars, the large breed of cocks in this country bear considerable resemblance, particularly in the comb, which extends backwards in a line with the eyes, and is thick, slightly raised, and upon the top rounded, and as it were cut off. The throat is bare, and there are two wattles from the under mandibles of comparatively small size. The head, neck, and upper part of the back is covered with pale golden-reddish hackles, which spring also slightly before the bare space of the throat. The centre of the back and lesser wing-coverts are deep chestnut, the feathers with the webs disunited, the hackles covering the rump, and base of the tail pale reddish-yellow, long and bending down. Tail very ample and entirely of a glossy green. Greater wing-coverts glossy-green, secondaries and quills with outer webs pale reddish-yellow. The whole under ports deep glossy blackish green, with strong reflections, and having the base of the feathers deep chestnut, which occasionally appears and makes these parts seem mottled and interrupted. The height of this specimen from the ground is about 2 feet.

The cocks with ample crests upon the head, five toes; the rumpless cock, and those of very varied colour, appear chiefly to have arisen from the various circumstances attending domestication and crossing. The most pleasing of these are specimens with a superabundant crest and auricular feathers. The crest is composed of narrow hackled feathers, which grow erect from the head, but fall down in graceful curves, and are sometimes so long as to overhang and shadow the eyes. In many parts this breed is much cultivated, and is esteemed in proportion as the colours of the body and crest can be got most conspicuously contrasted, a black body with white crest, and the reverse, &c. Other fancy breeds are also frequently seen in the Dutch Pencilled Fowl, pure white spotted with black, the Siberian Fowl, having long tufts of feathers springing from the lower jaws and hanging down, and the Barbary Fowl, of a pale dun colour, and having the feathers of the neck very ample and spotted with black. A more singular anomaly occurs in those with five toes, generally called Dorking Fowls from being found and bred in most abundance in the neighbourhood of Dorking in Surry. This race is easily continued, and seems analogous either to the six-fingered or six-toed individuals of mankind, or to the dogs with the additional claws. They are much esteemed, are generally pure white, and grow to a large size; Dr. Latham records one which weighed almost fourteen pounds. A still more anomalous race occurs perhaps in those without a tail, the Rumpless or Persian Cock, but we have also races analogous to them in the tailless races of dogs and cats.

There are three races of cocks, however, whose claim to actual distinction of species is not very well or satisfactorily ascertained, the Gallus morio, having the periosteum of the bones black, and the comb, wattles, and skin of a dull purple. It has received the name of Degro and Blackamoor Cock, but I believe is scarcely to be seen in the poultry-yards of this country. The other two varieties are more frequently seen, and are known as the Silky Cock (Gallus lanatus), and the Friesland Cock (Gallus crispus). The first, Temminck is inclined to consider distinct. It is found in Japan and China, and is sold

to Europeans as a rarity. In this country it crosses easily with the white domestic poultry, and a breed having the feathers less disunited and silky is the consequence. It is a curious fact, that the periosteum and skin of this bird are of the same dark colour with those of the Gallus morio, while the flesh is remarkably white. The size is rather small, the plumage of the purest white, the feathers having the webs disunited are of a silky appearance and feel, and the comb and wattles are of a laky purple. The Friesland or Crested Cock has all the feathers as it were turned the wrong way; they stand nearly at right angles with the body.

The general colour of the plumage is white, but it is often seen varied like the ether domestic races. It also occurs in a domesticated state in Java and Sumatra, but Temminck thinks it a distinct species, and peculiar to some parts of the Indian islands yet unexplored. We, however, think this less probable, that the two previously mentioned are separately originated, as we meet with analogous, variations in the hair of animals, which we know to belong to one race. It is from a better known species that the race of Bantams appears to have sprung; the Gallus bankiva of Temminck, which we have represented in the vignette accompanying this volume. It will stand as the Bankiva Cock.



BANKIVA COCK - GALLUS BANKIVA - TEMMINCK

Coq et Poule Bankiva, Temminck, Pigeons et Gallinacés, ii. p. 86 - Gallus Bankiva and Ayam utan or Brooga, Transactions of Linnaean Society, xiii. p.135 and 319 - Javan Cock, Latham General History vol. viii, p. 166 - Gallus Bankiva, Illustrations of Ornithology, plate 150.

Many Bantams so nearly resemble this bird, that there would be great difficulty in making a distinction. Around the eyes and the throat is bare, the comb is ample, with an irregular outline, and narrow strengthened lobes arise from the crown, and two wattles spring from the lower mandible. The head, back, and sides of the neck surrounding the bare skin upon the throat and the rump, are covered with long hackles of a clear and brilliant golden-orange. Below the hackles the upper part of the back is bluish-black, and the centre with the lesser wing-coverts are of a rich deep chestnut, the webs of the feathers quite disunited. The greater coverts are steel-blue, the secondaries of the same colour, with a broad margin of chestnut, the quills brownish-black, edged with pale reddish-yellow. The tail is black, with rich green and blue reflections, the whole under parts are black.

There is another bird, of which we have seen three or four specimens, very closely allied to this, but certainly distinct. The specimens alluded to were all from the continent of India. In size they were

rather larger than what we consider the true Gallus bankiva. The following is a description of one of them: comb large, dentated upon its frontal margin, an oval lengthened wattle at the base of each lower mandible, the cheeks, throat, base, and fore part of the neck terminating in a point bare of feathers. Crown of the head surrounding the comb yellowish-brown, changing into golden ochraceous-yellow, the colour of the exterior margin of the hackles, and most predominating. These cover the whole back and sides of the neck. Each hackle has a black centre, and is rather abruptly as it were worn off at the tip. The fore part of the neck is of a steel-blue surrounding the naked skin, the feathers rounded and solid. Under this the breast, belly, and lower part of the back is covered with hackles of a clear reddishyellow on the plain outer margins, the centres of a chestnut-brown, having the same form at the tip with those of the neck, and becoming broader as they reach the lower part of the body. On the shoulders the margins of the small feathers are of a pale golden-yellow, the centres chestnut-brown, edged on each side with black. As they approach the long hanging secondaries the margins become darker, and the centres only chestnut, nearly similar to those on the breast. On the lower part of the back, rump and part of the tail-coverts, the hackles are broad, the centres solid deep black, glossed with green, steel-blue and purple, none of them very lengthened or pendulous. The quills and secondaries black, glossed with steel-blue, the greater coverts chestnut on the outer webs. Belly and vent black. Tail nearly like that of the common fowl, perhaps a little more horizontal, centre feather longest, curved and bending out. The larger tail-coverts steel-blue, broad, curved, and bending outwards.

To this we refer the Gallus turcicus of Brisson, or Cock of Turkey. The true Bantams, so called from the name of the town in Java, are distinguished by the plumed legs, a variation incident only to cultivation and domestication. A still more dwarf race is known under the title of the Gallus pumilio; this is extremely diminutive but nearly of the same colours, and is much cultivated among cockfanciers. There is a club in the vicinity of London who compete and give prizes to those who succeed in producing the smallest breed.

These seem to be the principal cultivated races of these useful birds. Innumerable crosses are, however, made according to the taste of fanciers, remarkable both for their beauty and deformity. The origin of them all, and the claim of some to distinction, is however still in a certain obscurity, and will probably continue so.

The cock in some of its varieties was known at a very early period, but we have no traces how it was introduced to Greece or Southern Europe. It made a figure at the public shows of the Greeks and Romans who have preserved records of it upon their coinage, and in their mythology have dedicated it to Apollo, Mercury, Aesculapius and Mars. At the Roman banquets it was also for a while a prominent dish; the finest were fattened in the Island of Delos, whose inhabitants were proud of their success in feeding, and that island, with Rhodes, also produced the best and boldest at the public fights. Meal, milk, and darkness, were said to be the great secrets of the art:

Pascitur et dulci facilis gallina farina, Pascitur et tenebris, ingeniosa gula est. Martialis xiii. 62.

and the modern art of cramming, with all its cruelties, was also perhaps resorted to; for a law was afterwards made that no-one should bring to his table more than one fowl, and that this should neither be crammed nor forcibly fattened. In later days a certain superstition is attached to the cock and the various periods at which he crows; his crowing dispels all spirits, whether good or evil -- "Whether in sea or fire, in earth or air." The ghost in Hamlet 'faded at the crowing of the cock', and the idea has ever been a favourite one with poets and romancers, and is frequently called to assist in getting rid of the many mysterious forms which the embellishment of their story required. During the season of the Welsh ceremony of the plygan or cock-crowing, the cock was supposed to exert this power through the night to the utmost extent, an old opinion finely described by Shakespeare:

Some say that ever against that season comes Wherein our Saviour's birth is celebrated, The bird of dawning singeth all night long; And then, they say, no spirit walks abroad; The nights are wholesome; then no planets strike;

No fairy takes; nor witch has power to charm, So hallowed and so gracious is the time.'

But the most disgraceful purpose of luxury, fashionable amusement, or whatever it may be termed, to which this noble bird has been subjected, is that of cock-fighting. It is generally allowed to have been a Grecian institution, and at its commencement to have been held in the estimation of a rite entirely religious and political. By degrees its serious character became lessened, and it was practised with all its cruelties, and the zest heightened by the gambling propensities of its greatest supporters. It is supposed to have been introduced to this country in the time of the Caesars, and became a royal pastime. In India it has also been long known, and perhaps carried to a greater extent than among any other people whole fortunes and properties being staked, and even wives and children risked, upon the event of the contest. In England, with what was called 'throwing at cocks', it formed a prominent part in the amusements of Shrove-Tuesday, till so late as the commencement of 1700. It was permitted in the public schools as an amusement to the boys, the preceptor, in some instances, being obliged to furnish the victims, which served to lessen the expense of these institutions, by collecting a certain rent or due for each cock which was produced; and in a parish in the north of Scotland, according to the last Statistical account, the schoolmaster's perquisites were the cock-fighting dues, equal to one quarter's payment of each scholar.

Throwing at cocks is perhaps less known; the following description is given by Brand, in his interesting popular antiquities: "The owner of the cock trains his bird for some time before Shrove-Tuesday and throws a stick at him himself, in order to prepare him for the fatal day, by accustoming him to watch the threatened danger, and, by springing aside, to avoid the fatal blow. He holds the poor victim on the spot marked out by a cord fixed to his leg, at a distance of nine or ten yards, so as to be out of the way of the stick himself. Another spot is marked, at the distance of twenty-two yards, for the person who throws to stand upon. He has three shys or throws for two pence, and wins the cock if he can knock him down, and run up and catch him before the bird recovers his legs. In 1680 this custom was sanctioned in the environs of London and the proceeds applied to the poor-rates".

A hen was also sometimes made use of in another noisy and ridiculous pastime of this period --THRESHING THE HEN:

> At Shrovetide to shroving go thresh the fat hen, If blindfold can kill him, then give it they men.

Tusser

"The Hen", says Brand, "was hung at a fellow's back, who has also some horse bell: about him; the rest of the fellows are blinded, and have boughs in their hands, with which they chase this fellow with his hen about some large court or small enclosure, the fellow with his hen and bells shifting as well as he can, they follow the sound, and sometimes hit him and his hen; at other times, if he can get behind them, they thrash one another right favourably. When the hen was killed, it was boiled with bacon, and store of pancakes and fritters are made."

For economical purposes, there is no bird used to the same extent. Among all nations it is most extensively reared, and we believe is one of the only instances where artificial means have been attempted with success. The Egyptians have practised this manner of rearing poultry with the greatest nicety, and in the edifices heated by flues, and constructed for this purpose only, from 40,000 to 50,000 chickens could be hatched at once. This was attempted to be introduced into various parts of Europe by Réaumur, but with only partial success, and within these few years an establishment to a considerable extent was tried in London. The temperature of modern Europe is, however, too variable, and the greatest delicacy in the management of the heat is necessary. Among the birds belonging to this group not so generally known, and remarkable for the beauty of their plumage, we may first mention.

THE BRONZED COCK - GALLUS AENEUS - TEMMINCK

Plate IX - Coq bronze, Gallus aeneus, Temminck, Planches Coloriées, p. 374 Male. This beautiful bird seems first to have been figured in the Planches Coloriées from a single specimen sent from the interior of Sumatra by M. Diard. It is rather larger than the Bankiva cock. The comb is very large, and with an unbroken edge. The cheeks and throat are bare, and from the base of each lower mandible there is a small thick wattle; the whole of these parts are bright red. The feathers of the head, neck, and upper part of the back, are slightly lengthened, but do not take the usual long hackle shape and are of a

metallic green, with brilliant reflections. The plumes are of deep and rich purple and are edged with a broad border of pale lake. The tail is also purple with bright metallic green reflections. The throat, breast and the whole under parts, are of a deep black, shaded with purple, and in some lights with a greenish tinge.

THE FORK-TAILED COCK - GALLUS FURCATUS -TEMMINCK

Plate X - Coq ayam-alas; Gallus furcatus, Temminck, Histoire Naturelle des Gallinacés, ii. p. 261 - Pl. Coloriées, p. 483 - Gallus Javanicus, Horsfield.

This curious Cock was first described by Temminck in 1813. It is nearly two feet in length to the extremes of the tail. The cheeks are bare, the head furnished with a simple entire comb, and the throat with a single large wattle springing from the centre: they are all bright red. The head, neck, and upper part of the back, are remarkable, from the short and rounded form of the feathers: the centre of these feathers is of a deep metallic blue, which shades towards the edges to a golden-green and at the extremities they are finished with a narrow band of very deep black. The feathers of the lower part of the back and tail-coverts lengthened as usual, are of a deep black in the centre, and are bordered with a narrow stripe of pale yellow: those forming the wing-coverts are of the same form, but the pale narrow border is of a rich orange-red: the whole under parts are deep black. The tail is said to be carried more in a line with the body than usual, and to have a slightly forked form: the large hanging feathers are of a rich metallic green tinged with steel-blue. The bill, legs and feet, are yellow.

The hen has a circle round the eyes only, naked and of a livid tint: the head and back part of the neck are brown, and above each eye there is a reddish streak: the back and wing-coverts are of a dull green, with golden reflections, each vast feather having a greyish-brown margin: the greater coverts and secondaries are black, with greenish reflections, waved transversely with yellowish-brown, and having the tips entirely of that colour; the tail and wings brown, the feathers of the former edged with pale reddish, the whole of the under parts are grey, the tips of the feathers on the breast tipped with a deeper tint; the feet and legs brown.

The bird is said to be very abundant in Java and may be often seen during the day upon the edges of the woods and jungles, but possesses the same wary disposition of its congeners and the pheasants, and upon the least alarm runs for cover. Temminck observes that they are not kept in a domestic state, but that they occasionally breed with the tame hens -- a curious fact, and showing the uncertainty with which the true origin is clouded. The cry may be expressed, he says, by the syllables co-trek. The last that we shall here notice, is still more remarkable in the form of the neck and back feathers, which are completely separated in their form and colour from all others. It is ...



SONNERAT'S WILD COCK - GALLUS SONNERATI - TEMMINCK

Plate XI Male - XII. Female: Coq sauvage, Sonnerat's India, ii. pls. 94 & 95 - Phasianus Gallus, Lath. Index Ornithologicus - Coq et Poule Sonnerat, Temminck, Pigeons et Gallinacés, ii. p. 246 - Planches Coloriées, pls. 232, 233 - Sonnerat's Wild Cock, Latham's General History, vol. viii. p. 181.

Sonnerat's Cock has been dedicated by Temminck to its discoverer. The first notice we find of it which can be trusted, is in the Voyage to India by that traveller, under the title of Wild Cock, and asserting it as the probable stock from which all our domestic races have arisen. The very great difference of the structure of the plumage, however, renders this most improbable; and none of the domesticated races in India bear the least resemblance to it. It is a native of the continent of India, inhabiting the higher wooded districts, particularly Indostan, where among English sportsmen, it receives the name of Jungle Fowl; and specimens of it, next to the Bankiva cock, are much the most frequent in collections in this country. In size, it is nearly equal to an ordinary domestic fowl, the proportions rather more slender and graceful: the comb is large, and with an unequal margin; and double wattles hang from the base of the under mandibles. But the most singular part in the plumage is in the form of the shaft in all the long hackled feathers: those of the neck, wing and tail-coverts have a dark grevish ground, but the shafts are of a bright golden orange, and in the centre and at the tip dilate into a flat horny plate, similar to what is seen in the wings and tail of the Bohemian Wax-wing. They will, however, be better understood by the accompanying representations of their form. Their appearance is both singular and beautiful. The centre of the back, the throat, breast, belly and thighs, are of a deep and rich grey, having the shafts and edges of a paler tint. The tail is of a rich and deep green: the feathers which immediately succeed the long hackles of a rich purple, edged with a pale yellow, and those immediately succeeding of a golden-green, edged with grey, the whole with very brilliant metallic reflections. The bill, legs, and feet are yellow. The hen is about a third less than the cock, without comb or wattles. The plumage has no trace of the horny structure adorning the other sex. The upper parts of it are of a uniform brown: the feathers on the neck edged with a dark margin, upon the back and wing-coverts with a pale streak along the shaft, and on the wings, tail-coverts and tail, waved and mottled with darker markings. The throat and fore part of the neck is white, and on the rest of the lower parts each feather is of a greyishwhite, edged with dark brown; towards the vent the brown predominates. The less and feet are bluishgrey. Dr. Latham observes that this species is by far the boldest and strongest in proportion to its size, and in Indostan is anxiously sought after by the cock-fighters, seldom failing to secure the victory over the larger game cocks.



GALLUS LAFAYETTEI - CEYLON JUNGLE FOWL

This Jungle Fow1 is found only in Ceylon, now Sri Lanka, and the following information has been collected regarding this species. A personal communication dated 26th February 1975 came from W.L.E. de Alvis B.Sc. F.Z.S., Director, The National Zoological Gardens of Sri Lanka, Dehiwala, Sri Lanka (Ceylon).

"Thank you for your letter of 13/2/1975. Only one species of Jungle Fowl exists in Ceylon, namely Gallus lafayettei, the Ceylon Jungle Fowl. We exhibit 3 breeding pairs. They are kept in a large Walk-in Aviary where they not only thrive but also get somewhat tame. The Javan Jungle Fowl (Green) is also represented in our collection, but we have only one male at the moment. There is no related sub-

species to Gallus lafayettei, the species being peculiar to Sri Lanka. I have enclosed literature on the Ceylon Jungle Fowl extracted from two books which will provide you with all the information about their size, colour, characteristics and habits. I trust the information provided therein would be of help to you."

A further communication from the Director of the Zoological Gardens dated 17th June 1975 brought further information as follows: "Further to my letter of 26th February 1975, I wish to state that the number of birds has increased and now we have several young pairs that may start breeding soon. At the time of writing this letter we have some chicks that hatched out recently in the Walk-in Aviary. In captivity the Jungle fowls breed and raise their chicks in the same manner as they do in their wild state. The Jungle fowls in the Walk-in Aviary lay their eggs in shallow depressions made on the ground which are lined with dry leaves. The nest sites are in dense undergrowth. Chicks wander around feeding on insects and grain in addition to the food that is provided."

An enquiry was also directed to the Director of National Museums in Colombo, Sri Lanka, seeking information on the Ceylon Jungle Fowl and was answered in a communication from the Director, Department of Museums, Colombo, Dr. P.HD.H. de Silva dated 8th May 1975 and stated as follows: "I am in receipt of your letter dated 13/2/75. Ceylon has a species of jungle fowl, Gallus lafayettei, and I am glad that I can help you by furnishing you with some information on our species of jungle fowl. Enclosed herewith are two descriptions of the Ceylon jungle fowl, taken from two books written about the birds of Ceylon."

Both the Zoological Gardens and the Museum sent me the same material which is reproduced below. BIRDS OF CEYLON, by G.M. Henry page 257 - The Ceylon Jungle Fowl, Gallus lafayettei Lesson. Species peculiar to Ceylon.

"Size of a small, but not bantam, breed of domestic fowl. The jungle fowl is distributed throughout the Island, wherever jungle or dense scrub of any extent is to be found, but it is nowadays common only in the wilder parts of the dry zone. In the neighbourhood of villages and roads it is shy and wary, but in remote jungles it is sometimes very tame and will strut about and crow in full view, like a village fowl. A slight acquaintance with man and his ways, however, quickly changes it into the embodiment of caution. It spends its life in forests or its outskirts, never venturing far from cover, through, especially in wet weather, it likes to frequent open places, such as roadsides or glades, for the purpose of feeding free from drippings from the trees. Most of the hours of daylight are spent on the ground, where it walks with a jaunty carriage though with tail less elevated than in domestic fowls. If disturbed by human approach it generally runs for cover unless come upon suddenly when, with a great flurry of wings, it flies off to a distance; but if put up by a dog or other carnivore it almost invariably flies up to a branch of the nearest tree, from which it peers at its enemy, with tail elevated cackling its alarm for some time before flying off to a safer area.

The hen's cackle is a high pitched, metallic Kwikkuk, Kwikkukkuk. Her desire note, uttered when, for instance, she is about to lay an egg, is a Kra, Krark very like that of the domestic hen but higher pitched. She calls her chicks with a rather shrill cluck. The cocks crow, which appears to be basically on assertion of territorial claims, is a staccato, musical, ringing Chick, Chaw-choyik - the terminal 'ik' being higher in the scale than the nest; this crow is uttered with the somewhat depressed and the beak jerked sharply at each syllable. In the early morning the cock will crow for several minutes, while strutting up and down a branch of its roosting tree, before fluttering down to begin his morning feed. When challenging a rival, the crow is generally preceded by vigorous clapping of the wings together above the back, from three to six claps. Unfortunately for the cock, the sound of this clapping is very easily imitated, and numbers are thus lured within gunshot by this means. Although the cocks are very pugnacious, evidence of actual fighting is rare, crowing being normally sufficient for the maintenance of territorial rights; when a fight does occur, however, it is fierce and bloody.

The food of the jungle fowl consists of grain, weed seeds, berries, various succulent leaves and buds, and a large proportion of small animals, such as crickets, centipede and termites; the latter form the main food of the chicks. When nillu (a species of Strobilanthes) flowers and seeds in up country jungles, jungle fowl migrates to these areas in large numbers to fatten on the abundant seed. They are also very fond of seeds of the small hill bamboo which, like nillu, sends only at long intervals. The hens are very industrious scratchers, particularly when they have a brood of chicks. Early in the evening,

jungle fowl fly up into trees to roost, usually singly, but sometimes in pairs or family parties. Unless disturbed they will use the same perch night after night for considerable periods. The perch chosen is generally high, well screened with foliage, and not much thicker than a man's thumb.

The main breeding season is in the first quarter of the year, but often a second clutch is laid in August-September, and breeding may go on throughout the year. The courtship display of the male is very similar to that of a domestic cock; it consists of running closely round the hen with his body canted towards her so as to display as possible of his plumage, and especially the metallic purple rump feathers at the same time, the wing nearest to her is drooped and its primaries scraped with the foot. The nest often a shallow scrape in the ground, concealed by herbage, at the foot of a tree or beside a dead log; but many nests are above ground level, on top of dead stumps or on a platform of rubbish caught up in a tangle creepers etc.

The hen sits very close, and leaves her eggs only at intervals of several days. She approaches and leaves the nest very stealthily. The eggs number two to four; they are cream white, some very finely peppered, others more boldly but sparingly speckled with brown. They measure about 48 x 35 mm. The chicks are very precocious, learning to scratch as soon as they leave the nest. At the mother's alarm call they instantly scatter and disappear in an amazing way under dead leaves, etc., remaining motionless until her little cluck reassures them. Their wing feathers grow rapidly, and in a week, they are able to fly into trees to roost, which they do covered by their mother's wings, or even snuggled between her legs on the perch.

Ceylon Journal of Science - A MANUAL OF THE BIRDS OF CEYLON by W.E. Wait Page 303 - Gallus lafayettei – Description: The hackles of the neck and smaller wing coverts are golden, or straw yellow, with dark shaft stripes; on the crown of the feathers shade into chestnut, on the back, scapulars, medium wing coverts, and elongated feathers at the side of the rump into shining yellowish red with almost black shaft stripes; feathers of the lower back and centre of the rump amethyst with reddish chestnut margins; greater wing coverts black splashed with dull chestnut; primary quills dark brown, secondaries black with a metallic purple gloss; tail coverts glossy violet; tail feathers black with a purple and steel blue gloss; fore-neck glossy purple, the breast bright chestnut with dark shaft stripes, shading through reddish brown on the upper abdomen into dull blackish brown with rufous edges on the thighs and towards the vent; under tail coverts greenish black.

Female: The crown is dark brown, the sides and back of the neck, blackish brown with rufous edges to the feathers; these colours gradually shade into the fine, vermiculated, blackish brown and buff of the back, scapulars, and wing coverts; rump and tail similarly coloured, but the shafts of the feathers are darker; primary quills dark brown with lighter mottlings on the outer web; secondaries and greater wing coverts black, boldly marked with mottled, buff cross bars and tinged at the ends with rufous; the chin and the throat are almost naked; the fore neck and breast are mottled black and brown with broad, buff centres; lower breast and abdomen white with broad, black markings, which disappear towards the vent; under tail coverts of the same colour as the tail.

Young males resemble females, but the upper plumage is more rufous, and there is no white on the under ports. In the male the bill is brownish red, paler at the tip and on the lower mandible; comb orange yellow, shading into bright red on the edge; the naked face, throat, and wattles are purplish red, iris light yellow; legs and feet pale yellow, darker down the front; tarsus armed with a sharp spur. In females the bill is dark brown, paler beneath; iris olive yellow; feet and legs as in the male, but without any spur.

Male: length about 27"; wing 9.5"; tail 13-15"; tarsus 3.25"; bill from gape 1.2".

Female: length about 14"; wing 7"; tail 4"; tarsus 2.5"; bill 1.1".

Distribution: peculiar to Ceylon. Found in most parts of the island, except in the more cultivated districts. Its chief haunts are in the forests of north and the scrub jungle of the dry maritime districts. It ascends in great numbers to the Horton Plains and other elevated plateaux when the nillu (a species of Strobilanthes) is ripe, to feed on the seeds.

Habits: a jungle bird living largely in the cover of the undergrowth. In the morning and evening, especially after rain, it comes out on the roads, jungle paths, and open spaces in the forests, to feed; during the heat of the day it keeps well inside the jungle, and at night time roosts in trees. The cry of the cock, "cluck-joy-joyce" may be heard constantly from sunrise till about 9 a.m.; the hen has a

curious, little metallic clucking cry. The cocks appear to be polygamous, and to leave all family cares to the hens.

I have taken eggs in nearly every month of the year. The nest is sometimes a small hollow in the ground under a bush, or behind a fallen log, the eggs resting on a few dry leaves. I have, however, often found it in such situations as on the stump of a felled tree, the tangle of dry leaves caught up by a bush overhanging a water course, or in an oven shaped hollow in a tree trunk. The eggs vary in number from two to four. In shape they resemble those of a domestic hen. The ground colour is creamy white with light brown, or purple brown markings, which vary from an excessively fine stippling all over the egg to comparatively large and scattered freckles. Their average size is 1.82 by 1.39.

RED JUNGLE FOWL - GALLUS GALLUS GALLUS

From an enquiry directed to the Muzium Negara, Jalan Damansara, Kuala Lumpur, Malaysia, came the following from the Acting Curator of Natural History, Mr. Heah Soon Hock dated 28th February 1975: "I am directed to reply to your letter dated 21st February 1975 out the Red Jungle Fowl (Gallus gallus gallus). It is unfortunate that we do not have any specimen of the Jungle Fowl in the Museum but I have enclosed herewith photostat copies on information of the Jungle Fowl and I hope that will help you in your study."

The material referred to that follows has been taken from BIRDS OF THE MALAY PENINSULA author unknown.

Gallus gallus - the common Red Jungle Fowl - Phasianus gallus, Linn. Syst. Nat., 10th ed. 1758 p.158 (Pulau Condore, off the mouth of the Mekong). Malay Names: Ayam hutan; ayam denak; ayam borga.

Adult male: Top of head, dark orange; mantle, orange red, shading into golden orange on the longer hackles, which have their bases black and shaft stripes pale yellow, the black extending some distance towards the tip of the feather in an elongated V. Feathers of the mantle and wing coverts hidden by the hackles, black, glossed with violet or steely green; scapulars, secondary coverts and middle of the back, maroon, darker on the back and shading into golden orange on the rump hackles. Primary and secondary coverts, black, glossed with metallic purplish green; primaries brownish black, the outer webs edged with buff; secondaries, with the outer half of the outer webs, chestnut; the remainder, glossy steel black. Longer upper tail coverts and tail feathers, bronzy green; the middle tail feathers more purplish. Under surface, including the under tail coverts, black, slightly glossy. Surface of the tail beneath, oily black. A long sharp spur on each foot. Males have a post-nuptial or "eclipse" plumage. In July and August most cocks have short central tail feathers and long neck hackles moulted, but these are replaced by November.

Immature male: The male is at first very like the female; older birds differ from the adult in the feeble development of the comb, lappets, spurs and hackles; the feathers beneath the neck hackles, dull black, with little gloss. The chestnut parts of the secondaries mottled with blackish.

Adult female: Top of the head, chestnut; this colour continued as broad, ill-defined band round the neck. Short hackles of the neck and upper mantle, golden yellow; more orange on the sides of the neck, each feather with a broad black median stripe and a pale shaft stripe. Rest of the upper surface, including the outer webs of the secondaries, earthy brown, finely vermiculate with black; more coarsely so on the secondaries; feathers of the mantle and scapulars with fine white shaft stripes. Primaries, dull brown, a trifle paler or mottled on the outer webs. Beneath, fore neck, chestnut; breast, pale rufous brown, becoming paler on the abdomen, each feather with a pale shaft stripe; sides and flanks, earthy brown, vermiculated with black, also with pale shaft stripes. Under tail coverts, brownish black. Tail feathers, brownish black, the center pair with both webs and the others with the outer web mottled with pale rufous. No spurs on the tarsi; comb and lappets rudimentary.

Soft Parts: Male: Bill, pale horn colour, reddish towards the base of the lower mandible; iris, orange or yellowish brown; feet, pale lead colour; comb, bright crimson; facial lappets and skin on the throat, pinky red, paler than the comb. In the south of the Peninsula the ear lappet has generally a patch of whitish on the lower half; birds examined from Trang, in the Siamese Malay States and from Upper Perak, have the lappet entirely red. Female: Soft parts duller in colour.

Dimensions: Male: Total length, 27in.; wing, 9.5 in.; tail, 13.5 in.; tarsus, 3.1 in.; bill from gape 1.2 in. – Female: Total length, 16 to 18 in.; wing 8 in.; tail, 6.2 in.; tarsus 2.3 in.; bill from grape, 1.1 in.

Range in the Malay Peninsula: Universally distributed throughout the Malay Peninsula in suitable localities up to about 1000 feet in altitude. Probably at one time wild on the islands of Penang and Singapore, though it does not occur on them now. Found on the larger islands of the west coast, such as Langkawi and Salanga, but not on those of the east coast.

Extralimital Range: Races of the red jungle fowl are found from Kashmir through India, Burma, Yunnan and Tonkin, south through Siam and French Indo-China, the Malay Peninsula to Sumatra and Java. Not recorded from Borneo, but east of Java found in Bali, Lombok, Timor, the Celebes, throughout the Philippines and other islands east to the Sandwich Islands. It seems not improbable that in all localities east of Java and Bali the bird has been artificially introduced. The subspecies occurring in Java and South Sumatra is certainly distinct from the form or forms inhabiting the mainland of Asia, but there is much difference of opinion concerning the status of the continental races. It is customary to regard the Indian bird as distinct from that found farther east in Burma, Siam, the Malay Peninsula, etc., and some authors maintain four races., one in India, another in Tonkin and North Annam, a third in French Indo-China (excluding the extreme north) and a fourth in Burma, Yunnan, the Malay Peninsula and North Sumatra. That birds included in the fourth section belong to one race we have no doubt whatever. The main character on which the other races are differentiated is the size and colour of the ear lappets, but we are not yet disposed to accept any arrangement based on this character, which we mistrust, as final.

Nidification: We have no details concerning the nidification in the Peninsula except the following notes which have bean supplied by Mr. A.T. Edgar of Perak. Most birds seem to nest in January and February but nests have been noted from December to the middle of May. The eggs are slightly glossy, creamy white and measure about 1.9 by 1.4 in. The nest is a hollow in the ground, in secondary or scrub jungle, the eggs being laid on dry leaves or grass. The clutch in Perak is usually six eggs.

Habits: Very common in most parts of the Peninsula, except in the mangrove zone and in rugged, mountainous districts. The favourite localities affected are patches of secondary jungle in the vicinity of cultivation and the thick and tangled vegetation clothing the banks of the larger rivers; they are also often very numerous in bamboo forest. The crow is very like that of the domestic fowl, but less sonorous and not so prolonged. They feed early in the morning and in the late afternoon, when they come out on the edge of rice fields or on to patches of grass surrounded by thick cover, retiring to the jungle in the heat of the day. On the east coast they are especially common in the thick bush scrub surrounding the buffalo grazing grounds, into which they emerge in the early mornings and evenings, affording excellent shooting; elsewhere they keep to cover too close to afford much sport. They are found in small parties usually consisting of an old and a younger cock and several hens, but occasionally they are met with paired. Hens and chickens keep to themselves and are seldom met with except in the closest proximity to dense cover.

The following information came from a personal communication to me from Mr. Linus Simandjuntak -Zoo Veterinarian - Pemerintah Daerah Khusus - Kota Jakarta Proyek - Taman Margasatwa, Kebum Binatang, Pasar Minggu, Zoological and Botanical Gardens, Indonesia, dated March 17th 1975 and reads as follows.

"We received your letter asking information of the jungle fowl. Indonesia have two species of jungle fowl, and in our Zoo we have two males and two females Red Jungle Fowl, and two males and four females Green Jungle Fowl. This is the description of their general character in the wild:

1. Red Jungle Fowl (Gallus gallus bankiva)

Length of Male about 27 inches, of which nearly half is tail. Female 17 inches. The cock is very handsome, the tail iridescent and flame color on the back. The hen is mostly brown with the back yellow. Usually solitary cock, sometimes in pairs, or a cock accompanied by several hens. They are common in the vicinity of all pastures and open terrain, also occurs in the midst of extensive stretches of forest, though they prefer the light forest. Feeding: Many kinds of seeds and fruit of wild grass, small insects and also small reptiles. Nest: The nest is on the ground as well as in dense forest, and laid 4-5 eggs with the averages size of 48.10 x 35.60 mm.

2. Green Jungle Fowl (Gallus varius)

Their distribution is especially in Java and eastern part of small Sunda Island. Their main food is also seed and fruit of wild grass, small insects and small lizards, small glow worms. Nest: The nest is also on the ground and laid 4-5 eggs with the average size 44.90 x 35.50 mm. It is difficult to distinguish the nest of a Red Jungle Fowl and a Green Jungle Fowl. Generally, mainly confined to meadows and other open areas, heavy forest is avoided.

These are some information from this two famous of our domestic fowl, which are believed by Anthropologists were first domesticated by Bronze Age peoples about 4000 BC. Hope this information will have some value for you."

Again in a personal communication of 20/2/75 from Mr. F. Pesik - Librarian of Perpustakaan Negara, Dep. P and K, Jakarta (Tate Library of Jakarta), Salemba Raya 18, Jakarta, Indonesia, comes the following.

"We are pleased to inform you, that we have been receiving your letter 8th February 1975. We are very sorry to inform you that for the time being we don't have yet the collection you need. In this matter we advise you to contact with Bibliotheca Bogoriensis, Lemboga Perpustakaan Biologi dan Pertanian, 20 Ir A. Juanda St. Bogor. That library has complete collection about biological science and other field."

From Mrs. Maenmas Chavibit, Director of the National Library, Samsen Road, Bangkok, Thailand, 14/2/75, a xerocopy from a book named BIRD GUIDE OF THAILAND written by Dr. Boosong Lekagul and published by The Association of the Conservation of Wildlife, Bangkok. It reads as follows.

Red Jungle Fowl (Gallus gallus) Kai Poh - Large 60 cm. Very similar to Thai domestic fowl but the male is much more colourful, and the white patch above the root of the tail is prominent. In the rainy season the male sheds its beautiful plumes and looks dark, during which period it stops calling. Prefers bamboo forests with flowers. Two races (a) gallus, with white patch on ear lobes occurring in the eastern plateau and S.E. provinces; (b) spadiceus, lacks the white patch on ear lobes, occurs in the northern, western and southern provinces."

This account of the Jungle Fowl I feel brings forth a very important point where it is stated that one race has white earlobes whereas the other one does not. As any-student of the domestic fowl is aware, the Mediterranean breeds e.g. Leghorns, Anconas etc. carry white earlobes, whereas the Old English Game do not. This fact is quite important when considering the antecedents of present day breeds.

I have no argument with the theory that the Mediterranean and Old English Game breeds descended from the Jungle Fowls. Their type, habits, coloring among other things give every indication to this logic Therefore it would be logical also to expect the Mediterranean breeds to have some link with gallus (a) as referred to in the text from Thailand from Lekagul.

From THE MALAY ARCHIPELAGO by Alfred Russel Wallace (1890, 10th Ed.) page 83 comes the following.: "I also obtained here a specimen of the rare Green Jungle Fowl (Gallus furcatus), whose back and neck are beautifully scaled with bronzy feathers, and whose smooth edged oval comb is of a violet purple colour, changing to green at the base. It is also remarkable in possessing a single large wattle beneath its throat, brightly coloured in three patches of red, yellow and blue. The common jungle cock (Gallus bankiva) was obtained also here. It is almost exactly like a common gamecock, but the voice is different, being much shorter and more abrupt; whence its nature name is Bekeko."

These specimens were obtained near the village of Djapannan in Java between July 18th and October 31st 1861. In June-July 1856 Wallace visited the islands of Bali and Lombock and whilst on Lombock (page 121) he speaks of "fine jungle cocks -- the origin of all our domestic breeds of poultry, were amongst the birds that chiefly attracted my attention during our stay at Labuan Tring."

Wallace in the Preface of the 10th edition (1890) says that his collections of birds and butterflies were in the British Museum. The 1st edition of his book was published in 1868 -- six years after his return to England. He states there are very few alterations between the 1st and 10th edition.

GALLUS SONNERATI

An early description of Sonnerat's fowl comes from MOWBRAY'S TREATISE ON DOMESTIC AND ORNAMENTAL POULTRY, revised by L.A. Meall (1854) and states as follows.

Name: Coq Sauvage of Sonnerat; Phasianus Gallus of Latham; Coq Sonnerat of Temminck; and the Jungle Fowl of the Europeans.

Description: Size about that of our ordinary dunghill variety, but more slender, graceful and symmetrical; from 13 to 15 inches from head to rump; general plumage a rich and deep ash or slate colour, variegated with maroon and golden green; the neck, hackles and rump hackles a fine maroon marginated with a golden greenish hue; back and wing coverts of a dark ash, but the shafts of those feathers are of an orange tinge, and have this peculiarity, that they expand in the middle and again at the tip into a flat horny plate, giving the fowl, it is said, a singular and beautiful appearance; the tail, formed of broad flat feathers, with one or two drooping over, of a deep and metallic green; the under parts and thighs a grey or drab; and the legs straw colour, and long; comb large, upright, and indented; bill yellow, with full wattles beneath; throat naked. The hen is about two thirds the size of the male; of far more sober tinted plumage; being mostly of a tolerably uniform brown, shaded with a deeper hue, presenting on the back, wing coverts, and wings, the appearance or markings generally known among poultry fanciers here as "partridge"; the underparts a light ash or deep grey; throat and upper portion of the neck white; has only a trace of a comb or wattle, but has a red patch on the cheek extending beneath the eye; legs of a deep grey.

Author's note: Jardine's notes appear elsewhere in this treatise and says that the female has not the horny expansions visible in the shafts of the feathers of the cock, as already described; but that Col. Sykes who wrote from actual observation states in the proceedings of the Zoological Society, 1832, that their occurred on the female is by no means rare.

History: This fowl was first discovered by Sonnerat, and described by him in his voyage to India; of which continent it is an aboriginal: it is found in the woods and jungles of the western Ghauts and the Mahrattas. It is found also at an elevation of 2000 feet above the ocean. They are excessively shy, wary, and cunning; and therefore exceedingly difficult to take. Their capture is a source of much amusement to the sportsman of India, and of profit to the lower caste of natives, who snare them and sell them for a livelihood. Though capable of being domesticated, they are uncommonly pugnacious, for which quality they are much sought after by the Mussulmen for the cockfights, of which they are so fond; and it is said few other game fowls can stand up against them. The Zoological Society of London have frequently exhibited specimens received direct from India.

A fine and genuine specimen of this noble fowl is now (or was some time since) in the possession of Dr. Horner, of Hull, who states that he obtained it from the Rev. E.S. Dixon, of Cringleford near Norwich, and that now the Regent Park specimen is dead, his is the only true living cock bird in this country. There are, says the Doctor, some spurious things to be met with, but in those the true marks of the Sonnerat are wanting.

It will be noted in all descriptions of the Sonnerat fowl the tips of some of the feathers at the tip expand in a flat horny plate. To my knowledge this trait has not been transmitted to modern day breeds. There is a small sketch of these feathers in this treatise. What genetic factors it possesses I do not know.

The information I do have of the trait being transmitted to its offspring comes from THE POULTRY BOOK by Wingfield and Johnson (MDCCCLIII) page 237 wherein they speak of Dr. Horner (mentioned previously) crossing his Sonnerat cock which he had learnt from Mr. Hutt chief superintendent of the aviaries at the Zoological Gardens, Regents Park, was bred at these Gardens, between the true Sonnerat Jungle Fowl and a Game hen (there is no indication given as to what kind of game hen this was): "This cock was described as being decidedly less than the Game cock (once again, no indication being given as to the kind of Game), weighing but 3 lbs, and differing both in gait and carriage, as well as in shape, from all other poultry. He is remarkably quick, showing great activity and alertness in all his movements. In his ordinary walk he is not so upright as the Game, indeed, he has often somewhat of a stooping manner; his wings are drooping or carried low, which gives his back a rather rounded appearance, and showing off to advantage its rich plumage; the tail, also, is not carried so high as in other fields. When at all excited, his gait and attitude are light graceful, and peculiarly alert. The eye is particularly bright, sharp, and watchful; the wattles, and the comb, which is serrated, are of moderate size; the whole side of the head is red and smooth. The feathers, of the golden coloured hackles, of the neck, the larger of which are round or blunt at the end, and the fine, rich, dark, crimson feathers of the shoulders or saddles, have their shafts, or midribs, dilated, in one or two parts, into horny like plates, as seen on the wing of the Waxen or Bohemian Chatterer, and which are of an exceedingly rich, deep golden yellow; giving to the plumage a very refulgent and sparkling appearance, especially when the sun shines thereon. The feathers of the breast and back are more pointed than in other poultry, and are of a fine greyish colour, lighter in the middle part, and fringed on the edges, some with greyish-white, others with various shades of yellow. The tail is of a shining greenish black, the smaller feathers near its roots being a rich refulgent purple green, and some of them are laced with yellow; the legs are of a red colour."

The foregoing description was of a hybrid Sonnerat as admitted by the writer. I have compared this description against a coloured drawing of Gallus sonnerati in "Australian Natural History" - January/March 1977 – Vol. 19 No.1, the magazine of the Australian Museum in Sydney. The drawing originally came from John Gould's BIRDS OF ASIA 1883. The drawing proffered fits very closely the description of the wild Sonnerati except for the colour of the legs and the position of the wings, which in the drawing are held up a little. This drawing together with drawings of Gallus lafayettei and Gallus bankiva from the same source appear elsewhere within this treatise, but are in black and not colour unfortunately.

The description from Wingfield and Johnson is of the F1 hybrid of a Sonnerat crossed with a Game hen of an unknown origin. If this were the case with so many traits of the wild Sonnerat being evident it would lead one to believe that these traits were of a dominant nature by turning up in the F1 generation. Of course colours, combs, legs, shape etc. would be mostly found in many of our domestic breeds.

The point that puzzles me however is why then has the unusual feather tips with the horny plate not continued on through the heredity process to our present day breeds. Whether there is any genetical information available on this particular trait I do not know. However I feel it is a matter that warrants some further study. Perhaps who reads this may have information to add which will enlighten us.

I scanned through GENETICS OF THE FOWL - F.B. Hutt (1949) but found no information regarding the feather in Gallus sonnerati that we have been discussing. So at this point of time I can offer no further information to resolve the non-existence of this feather formation in our present day breeds. Hutt however does speak of the differences in colour genes between Gallus sonnerati and Gallus gallus and Gallus lafayettei which I quote as follows: "The generally reddish plumage of Gallus gallus and Gallus lafayettei shows that these species carry the recessive sex linked gene, s, which induces in the feathers a golden upon which black patterns may be super imposed. In contrast to this, Gallus sonnerati evidently carries the dominant silver allele, S, which induces a white ground in place of a golden one. When stippling, lacing, pencilling, or other patterns are present with silver, the general appearance is grey, as it is in Gallus sonnerati. In this species, the shafts of the neck feathers are prominent, and the hackles have up to three wide whitish bars. The central shafts are also prominent in the plumage of the females. In these the secondaries are mottled, not barred as in females of Gallus lafayettei. The eggs are some times spotted, sometimes not. The vocal utterances of Gallus lafayettei and Gallus sonnerati are quite distinct from those of Gallus gallus."

Of further interest I feel from Hutt: "As might be expected in a species having such a wide distribution, the Red Jungle Fowl varies somewhat in different parts of its range. Darwin stated that the Malayan birds generally had red 'ear lappets' instead of the white ones of the Indian birds and that the legs were leaden blue in Indian specimens but tended to be yellowish in birds from Malaya and Java. Since 1910 there has been an increasing tendency on the part of 'splitting' ornithologists to identify geographic races as subspecies. As a result Peters (1934) lists the following four subspecies of Gallus gallus:

Gallus gallus murghi, Robinson and Kloss: from Kashmir to eastern Assam, south to the Godavari River in Central India and southern Assam.

Gallus gallus, Linné: with the wide distribution given.

Gallus gallus jabouillei, Delacour and Kinnear: in Tonkin and northern Annam.

Gallus gallus bankiva, Temminck: in Java."

Hutt summarises as follows: "Little or no real evidence to support the theory of monophyletic origin has been advanced since Darwin discussed the problem. That scientists did not consider the evidence for such an origin as good for the fowl as for the pigeon. However, constant repetition of the familiar statement that all domestic fowls are descended from the Red Jungle Fowl of India has apparently led some writers to consider the question settled. The statement of Beebe (1918-1922 Vol.11) that 'there can be no doubt that the Red Jungle Fowl alone is the direct ancestor of all our domestic poultry, so this question is removed from the discussion' would be difficult to prove. Punnett (1923) suggested that systematic crossing of the four wild species with one another and with domestic breeds is desirable and that 'until this is done there can be no certainty as to the manner in which our various races of poultry have arisen, and any further discussion as to their origin is merely waste of time'. This is a pertinent now as when it was first written."

Beebe's statement "that the question is removed from discussion" seems to me to be a pretty heavy statement to make although it was made some 60 years ago. I think in a study such as we are discussing no one can honestly say that things such as Beebe alludes to can be finalised just like that. Events and discoveries over recent years don't lend any support to Beebe's statement. As mentioned previously much of the earlier material on the domestic fowl will now need reappraisal in view of recent recoveries, e.g. Zhou's work at Cishan in Northern China.

Punnett's suggestion regarding the breeding together the wild species etc. has a lot of merit. If this had been done on an organised basis I am sure we would know much more about the subject than today. I do remember noting somewhere some years ago that experimental work along these lines had been carried out in Ceylon. How far this work progressed and the results from it I am not aware.

Referring back to Punnett's suggestion, he did not mention using Gallus giganteus which I feel could also have been used in a separate experiment. Unfortunately though it would be most unlikely that pure Gallus giganteus would have been available at that point of time. Even less chance now.

Another personal communication dated 28th March 1975 from Miss Shahar Banun Jaafar, for the Director General, National Archives and Library, Perpustakaan Negara, Malaysia, National Library of Malaysia, Tingkat 7, Bangunan UMBC, Jalan Suleiman, Kuala Lumpur, lists the titles of books available for further reading on the subject and comes as follows: "Information on Malaysian Jungle Fowl - With reference to your letter dated 21st February 1975 on the above subject matters, I am listing below some of the titles pertaining to the subject that are available in the National Library of Malaysia.

1. Gibson-Hill, C.A. An annotated list of the birds occurring, or known to have occurred in the territories of the Federation of Malaya and the Colony of Singapore. Singapore: Government Printing Office, 1949. (Bulletin of the Raffles Museum Singapore No. 20, September, 1949)

2. Glenister, A.G. The birds of the Malay Peninsula, Singapore and Penang; an account of all the Malay species, with a note of their occurrence in Sumatra, Borneo and Java and a list of the birds of those islands. Kuala Lumpur: Oxford University Press, 1971.

3. Madoc, G.C. An Introduction to Malayan birds. Kuala Lumpur; Malaysian Nature Society, 1956.

4. Symes, Gwyn, Introduction to bird watching in Malaya. London: University of London Press, 1968.

5. Weedie, M.W.F. Common birds of the Malay Peninsula. Kuala Lumpur; Longmans Malayasia, 1970.

6. Tweedie, M.W.F. Common Malayan Birds. London: Longmans, 1960.

Below is a sketch of the horny plated feathers of Gallus sonnerati copied from Jardine's book mentioned in the preceding text.



I think a section of Charles Darwin's 'Chapter of Fowls' in his book THE VARIATION OF PLANTS AND ANIMALS UNDER DOMESTICATION is relevant here so I will give this to you from my copy (1896) speaking on the Bankivoids. Perhaps the reader may find some of this repetitive, however, I feel Darwin's views should be put before the reader with the rest. It reads as follows.

"But it will be convenient first briefly to describe all the known species of Gallus. The Gallus sonnerati does not range into the northern parts of India; according to Colonel Sykes, it presents at different heights of the Ghauts, two strongly marked varieties, perhaps deserving to be called Species. It was at one time thought to be the primitive stock of all our domestic breeds, and this shows that it closely approaches the common fowl in general structure; but its hackles partially consist of highly peculiar, horny laminae, transversely banded with three colours; and I have met no authentic account of any such character having been observed in any domestic breed. This species differs greatly from the common fowl, in the comb being finely serrated




A. Internal organs: a. Spinal cord. b. Empty crop. c. Esophagus. d. Windpipe. e. Pectoral muscles. f. Back-bone. g. Lung portion. d. Windpipe. e. Pectoral muscles, f. Back-bone. g. Lung portion. h. Heart. i. Breast-pone. j. Liver. k. Glandular stomach \$proventriculus.} l. Intestines. m. adrenal gland. n. Thickened portion of spinal cord. o. Testicle. p. Gizzard. q. Kidney. r. Intestimes. s. Vas deferens or seminal canal. t. Remnant of bursa fabriculus. U. Vent. v. Oil gland. B. Muscular development of flyer and (M) of runner.

Cockfighting All over the World Finsterbusch 1929 and in the loins being destitute of true hackles. Its voice is utterly different. It crosses readily in India with domestic hens; and Mr. Blyth raised nearly 100 hybrid chickens; but they were tender and mostly died whilst young. Those which were reared were absolutely sterile when crossed inter se or with either parent. At the Zoological Gardens, however some hybrids of the same parentage were not quite so sterile: Mr. Dixon, as he informed me, made, with Mr. Yarrell's aid particular inquiries on this subject, and was assured that out of 50 eggs only five or six chickens were reared. Some, however, of these half bred birds were crossed with one of their parents, namely a Bantam, and produced a few extremely feeble chickens. Mr. Dixon also procured some of these same birds and crossed them in several ways, but all were more or less infertile. Nearly similar experiments have recently been tried on a great scale in the Zoological Gardens with almost the same result. Out of 500 eggs, raised from various first crosses and hybrids, between Gallus sonnerati, bankiva and varius, only 12 chickens were raised, and of these only three were the product of hybrids inter se. From these facts, and from the above mentioned strongly marked differences in structure between the domestic fowl and Gallus sonnerati, we may reject this latter species as the parent of any domestic breed.

Ceylon possesses a fowl peculiar to the island, viz. Gallus stanleyi; this species approaches so closely (except in colouring of the comb) to the domestic fowl, that Messrs Layard and Kellaert would have considered it, as they inform me, as one of the parent stocks, had it not been for its singularly different voice. This bird, like the last crosses readily with tame hens, and even visits solitary farms and ravishes them. Two hybrids, a male and female, thus produced, were found by Mr. Mitford to be quite sterile; both inherited the peculiar voice of Gallus stanleyi. This species, then, may in all probability be rejected as one of the primitive stocks of the domestic fowl.

Java and the islands eastward as far as Flores are inhabited by Gallus varius (or furcatus), which differs in so many characters -- green plumage, unserrated comb, and single median wattle -- that no one supposes it to have been the parent of any one of our breeds; yet, as I am informed by Mr. Crawford, "hybrids are commonly raised between the male Gallus varius and the common hen, and are kept for their great beauty, but are invariably sterile; this, however, was not the case with some bred in the Zoological Gardens. These hybrids were at one time thought to be specifically distinct, and were named Gallus aeneus. Mr. Blyth and others believe that the Gallus temmincki (of which the history is not known) is a similar hybrid. Sir J. Brooke sent me some skins of domestic fowls from Borneo, and across the tail of one of these, as Mr. Tegetmeier observed, there were transverse blue bands like those which he had seen on the tail feathers of hybrids from Gallus varius, reared in the Zoological Gardens. This fact apparently indicates that some of the fowls of Borneo have been slightly affected by crosses with Gallus varius, but the case may possibly be one of analogous variation. I may just allude to the Gallus giganteus, so often referred to in the works on poultry as a wild species; but Marsden the first describer, speaks of it as a tame: evidently has the aspect of a domestic variety.

The last species to be mentioned, namely, Gallus bankiva, has a wider geographical range than the three previous species; it inhabits Northern India as far as Sinde, and ascends the Himalayas to a height of 4000 feet; it inhabits Burma, the Malay peninsula, the Indo-Chinese countries, the Philippines Islands and the Malayan archipelago as far eastward as Timor. This species varies considerably in the wild state. Mr. Blyth informs me that the specimens, both male and female, brought from near the Himalayas, are rather paler coloured than those from other parts of India; whilst those from the Malay peninsula and Java are brighter coloured than the Indian birds. I have seen specimens from those countries, and the tint in the hackles was conspicuous. The Malayan hens were a shade redder on the breast and neck than the Indian hens. The Malayan male generally has a red ear lappet, instead of a white one as in India; but Mr. Blyth has seen one Indian specimen without the white ear lappet. The legs are leaden blue in the Indian, whereas they show some tendency to be yellowish in the Malayan and Javan specimens. In the former Mr. Blyth finds the tarsus remarkably variable in length. According to Temminck the Timor specimens differ as a local race from that of Java. These several wild varieties have not as yet been ranked as distinct species; if they should, as is not unlikely, be hereafter thus ranked, the circumstance would be quite immaterial as far as the parentage and differences of our domestic breeds are concerned. The wild Gallus bankiva agrees most closely with the black breasted red Game breed, in colouring and in all other respects, except in being smaller and in the tail being carried more horizontally. But the manner in which the tail is carried is highly variable in many of our breeds, for, as Mr. Brent informs me, the tail slopes much in the Malays, is erect in the Games and some other breeds,

and is more than erect in Dorkings, Bantams etc. There is one other difference namely, that in Gallus bankiva, according to Mr. Blyth the neck hackles when first moulted are replaced during two or three months not by other hackles, as with our domestic poultry, but by short blackish feathers. Mr. Brent, however, has remarked that these black feathers remain in the wild bird after the development of the lower hackles, and appear in the domestic bird at the same time with them: so that the only difference is that the lower hackles are replaced more slowly in the wild than in the tame bird; but as confinement is known sometimes to affect the masculine plumage, this slight difference cannot be considered of any importance. It is a significant fact that the voice of the male and female Gallus bankiva closely resembles, as Mr. Blyth and others have noted the voice of both sexes of the common fowl; but the last note of the crow of the wild bird is rather less prolonged. Captain Hutton, well known for his researches into the natural history of India, informs me that he has seen several crossed fowls from the wild species and the Chinese bantam; these crossed fowls bred freely with bantams, but unfortunately were not crossed inter-se. Captain Hutton reared chickens from the eggs of the Gallus bankiva; and these though at first very wild, afterwards became so tame that they would crowd around his feet. He did not succeed in rearing them to maturity; but as he remarks "no gallinaceous bird thrives well at first on hard grain". Mr. Blyth also found much difficulty in keeping Gallus bankiva in confinement. In the Philippines Islands, however, the natives must succeed better as they keep wild cocks to fight with their domestic game birds. Sir Walter Elliot informs me that the hen of a native domestic breed of Pegu is undistinguishable from the hen of the wild Gallus bankiva; and the natives constantly catch wild cocks by taking tame cocks to fight with them in the woods. Mr. Crawford remarks that from etymology it might be argued that the fowl was first domesticated by the Malays and Javanese.

It is also a curious fact, of which I have been assured by Mr. Blyth, that wild specimens of the Gallus bankiva, brought from the countries east of the Bay of Bengal, are far more easily tamed than those of India; nor is this an unparalleled fact, for, as Humboldt long ago remarked, the same species sometimes evinces a more tameable disposition in one country than in another. If we suppose that the Gallus bankiva was first tamed in Malaya and afterwards imported into India, we can understand an observation made to me by Mr. Blyth, that the domestic fowls of India do not resemble the wild Gallus bankiva of India more closely than do those of Europe."

The preceding text from Darwin does have some significant facts whereby he mentions that from different areas Gallus bankiva comes with dark legs and yellowish legs. He also mentions that red and white ear lappets also appear. Therefore we would expect the genes for these four traits to be present in Gallus bankiva. As it is proposed by Darwin that our present day domestic fowl descended from Gallus bankiva, the yellow legs and white ear lappets would have been transmitted to the Mediterranean breeds -- Leghorn, Ancona etc. the dark legs and red ear lappets transmitted to the Old English Game.

With all respect to Darwin he explains away some things as "cannot be considered of any important". This to my way of thinking is just not good enough. He would appear be biased towards Gallus bankiva being the sole progenitor of all our domestic fowls.

Admittedly he did not have the benefit of Gregor Mendel's paper on the laws of inheritance and had to rely on a lot of information passed onto him by others. I suspect a man of Darwin's ability of assessment if he had known of Mendel's deliberations would have perhaps reassessed some of his findings.

As mentioned elsewhere the fact that Gallus bankiva carried the genes for gold, whilst Gallus sonnerati carried the genes for silver, I would suggest perhaps both may have been involved. However Darwin ruled Gallus sonnerati out of contention. However it does seem apparent that Gallus bankiva did play a large part in the development of the races previously mentioned. The question still remains unanswered. From whence did Gallus bankiva, Gallus sonnerati etc. emanate?

TRAPPING JUNGLE FOWL IN BURMA

Back in 1977 I made contact with Tom Hodgson of the Everlay Stud Poultry at Tahmoor, NSW. Tom spent some of his early life living in Burma and sent me the following story of his experiences in the trapping of Jungle Fowl in that country. Ho also sent a sketch which I have copied showing the snaring method used. I trust this will be of interest to my readers.

Tom mentioned in 1977 that he was working on making up a synthetic Gallus bankiva. I saw the results in 1985 which I will pass on to you a little later. His story is as follows.



The method of snaring Jungle Fowl in Burma

"I have read with keen interest the articles on the Red Jungle Fowl (Gallus Bankiva) written by Mr. W.J. Plant in the Fancier's Gazette. He has done much research into this breed of fascinating fowl and I would like to congratulate him publicly for a job well done. Your readers might be interested to learn how the Red Jungle Fowl is trapped in Burma. There are three ways of trapping them. The first is by using a domesticated cockerel or cock; the second, a hen and the third by making the call of a love-sick jungle hen to lure the wild cock to the snares set to trap them.

The snares are made of bamboo stakes about 4 inches long, with cane to hold the cotton noose in place. There are 25 snares to each bundle and each snare is attached to the other by a stout string clove hitched at the join of the cane and stake.

When employing the first method of trapping you have to get quite near the crowing wild cock and just before he comes down from his night's roost. Jungle fowl unlike domestic fowls, do not rest at the same place each night. The cock never sleeps with his harem on the same bush or tree. His crowing, draws the hens to him and other wild jungle cocks away from him, unless of course they want to fight him and claim his territory.

The trapper looks for a large tree. He places one bundle of snares close to each other by pushing the stakes into the ground to form a semicircle around the tree. Then he places three bundles similarly to the first but at right angles to the semi-circle made by the first bundle of snares. Finally, he places one or two bundles of snares to form a larger semi-circle at right angles to the three bundles. None of the bundles of snares are tied to each other or to a stake because the strength and force used by the trapped wild cock or hens to make its getaway would snap the noose.

The trapper allows the snared wild cock to fly away with the whole bundle because he knows that the remaining snares would become entangled with twigs and branches from neighbouring shrubs and small trees as the cock flies off and before long he would be found hanging head downwards exhausted from his fight for freedom. The bushes and small trees "play him" in the same way as an angler plays his fish.

When the trapper is satisfied and everything is ready, he places the decoy domesticated cockerel at the base of the tree within the first semi-circle made with the first bundle of snares. The decoy cockerel is tied to an iron stake with a swivel to allow him to move around feely but about a foot away from the snares, the trapper then hides himself and makes the call of a love-sick jungle hen. The decoy cockerel beats his wings with gusto and gives a loud challenging crow. He repeats his crowing in rapid fire succession and the wild cock may respond with a crow or two, but usually he alights from his perch and stealthily approaches the decoy cockerel.

On seeing the wild cock, the decoy cockerel beats his wings and crows for all his worth. This of course infuriates the wild cock and he either rushes in to do battle or sidles up only to be caught en route in one of the snares. The wild cock on being caught by his leg in one of the snares gives a typical "What the Hells going on here" and explodes to free himself. The force he uses pulls up all the snares and their stakes from the ground behind him and he makes his getaway. But soon he is hanging downwards a few yards from where he was caught. The trapper grabs one foot, releasing the wild cock from the snare and puts him in a carrying basket or wrings his neck and puts him into a shoulder bag the trapper carries for this purpose.

The second method employs a decoy hen. She is placed in exactly the same way as the male decoy but two things must be taken into consideration in employing hen decoys. First the trapper must make sure most of the wild hens of the harem belonging to the crowing wild cock are either broody or with chickens. That is quite easy to ascertain by creeping up to the wild cock and looking to see if he is alone. If the wild cock is alone he responds immediately to the call of the decoy hen and meets his "waterloo". However, if he is in company of some hens, he does not bother to go near the decoy hen,in spit of her tantalising love-sick calls, but crows vigorously instead, to entice the decoy hen to join him.

The trapper of course does not want to be beaten by the wily old jungle cock so he removes a snake skin from his carry-all bag, attaches a thin twine to it and places near the decoy hen. He holds the other end of the twine and returns to his hiding place. He then proceeds to pull the twine which in turn moves the snake skin. The decoy hen sees the snake skin and kicks up a terrible shindy like a woman does on suddenly seeing a mouse. The wild jungle cock hears her and being the gallant leader always, he hurries to soothe the decoy hen only to be snared to his doom.

The last and final method used in trapping is used later in the season when all the wild hens are broody or with chicks. The trapper hides himself under a bush after setting the snares around it. He closes his right hand gently and blows through the small hole made by his forefinger and thumb by placing his lips against them. A little practice is all that is needed to become adept at making this love-sick call of a hen. On hearing the call made by the trapper the wild cock responds immediately. He beats his wings, gives a lusty crow, places his two wings on either side of his legs and charges towards the trapper only to be snared.

When I was 12 years old I accompanied U Fo Teke, a veteran trapper on my first trapping expedition. We placed the decoy cock with all the snares in position and retired under a wild mango tree to hide. The ripe mangoes on the tree tempted us immensely, so I placed my B.S.A. air rifle up against the trunk of the tree and together we climbed up as silently as possible and began plucking and tucking away at the sweet juicy fruit. Our feasting was soon brought to a halt when we heard a struggle and a squawk and saw a leopard devouring U Fo Teke's decoy cock. We remained silent. When the leopard had his delicious meal of chicken he went his merry way.

We hurriedly climbed down from the mango tree, left the air rifle and old Fo Teke's gear and made a bee-line for the railway line where my father was busy constructing a railway line in the jungle. I told Dad what had happened. He was not so worried about losing the decoy cock to the leopard, but was more concerned with my leaving my air rifle in the jungle. Dad arranged a beat shoot after we had lunch and bagged the leopard with his 405 rifle. It turned out to be a leopardess with a very fine skin. I got back my air rifle. It was a momentous day for me for had I not reached another milestone in my life, being initiated into the joys of trapping jungle fowl and taking part in a big game shoot."

The following article appeared in the newspaper "Poultry" May 18th, 1940. "Poultry" was published weekly in Sydney, NSW, from around 1918 to the early 1970's. Mr. Cecil R. Thompson, the author of the article was a regular contributor to the paper over a number of years. It is quite an interesting article although one thing does puzzle me as Mr. Thompson refers to the likeness of the Jungle Fowl and the Modern Game type. All the drawings I have observed, including the one accompanying Mr. Thompson's article, resemble more to the Old English Game type. This is the only instance I have found which refers to the wild fowl being of Modern Game type. However, lets get on with the story which reads as follows.

THE INDIAN JUNGLE FOWL

"The Jungle Fowl is a very beautiful bird and it is very doubtful if there are a dozen pairs in captivity in the world; thousands of birds so described however, are sold every year but they are not even half bred. On my second trip to India I remained three years and my long study and acquaintance with the wild animals and birds of that country enable me to call to memory many exploits and ramblings amongst them so clearly that it seems but yesterday.

JUNGLE FOWLS NATIVE HABITAT - Wandering along the outskirts of the jungle you will be very unfortunate if you do not see the strange little Jungle Fowl. There can be no mistaking him; he closely resembles the Modern Game type, but is smaller; he has a similar comb to the Modern Game cock; earlobes are white in and around Bengal, and almost red in other parts; his spurs and toenails are dark. One will often find parties of ten to twenty in close proximity to irrigated land so that when in season, they can feed on the cultivated grains. In their wild state they live mostly on the tender shoots of the bamboo and other green herbs; they devour ants' eggs, insects and jungle fruit to a surprising degree.

The cock falls into a partial moult in June casting his sickles and neck hackle which are replaced with short round feathers; he drops into a full moult in September, which is the rainy season -- not such rain as we get in NSW, but a warm, growing rain, a rain that turns a desert into a tropical garden in a few days. At this period the Jungle Fowl retires into the dense jungle where the foliage overhead enable it to keep dry. One will hear the peafowl invariably screech before roosting, as if to warn the roosting birds that it is time to do so, for it is then that their enemies - the lynx, jackal, wild cat, etc. - commence their prowling.

HABITS OF JUNGLE FOWL - Half an hour after sunset is the time the jungle fowls go to roost. When they arrive at their abode, which is generally a large and difficult thorn bush, thickly branched and providing an escape from detection, they become very restless. The cock gives a crow, as it to collect all his flock together, and then flies up and inspects the bush and the surroundings, giving a few chuckles of satisfaction, he flies to the ground and coaxes the party to fly up and, when they are settled, he will drop down on to an anthill or a branch of a small tree and give his final crow which is shrill and short. Returning to the roosting place, he indulges in a sharp look around and then returns to his perch in the bush and settles down for the night. At daybreak the fowls dismount from their perch and seek food. One can always identify the roosting place of the jungle fowl and the peafowl by inspecting the droppings under the bush.

SURVIVAL OF THE FITTEST - The hens hide their nests, generally in a cavity on a mound or bushy tuft of grass, with good covering from the rain; after laying they will run some distance away before they begin to cackle. The eggs number from nine to eleven and, very rarely thirteen. The jungle fowl lays eggs simply to reproduce its kind and the wild breeding pen consists of hardy, vigorous birds, the survival of Nature's cruel laws. The male has been victor in many gory combats -- a fearless leader, in every natural way suited to be head of the reproducing department.

THE LAW OF THE JUNGLE - Speaking of Nature's cruel laws, the operation of these mean that any weakling or deformed bird soon dies, being left behind by their more favoured mates and succumbing to weather, vermin, want of food or water, or other evils. The few survivors are required to be fit in every way; a barren hen would be cast out of the harem and soon perishes; a fat or sluggish hen would soon be stalked and make a meal for some beast of prey. A cock hen would be quickly slain by the lord of the harem and the stalking death of the relentless jungle soon eliminates all but absolute fitness from the wild breeding pen. The hen with young chickens goes off into the almost impenetrable scrub close by. The chickens are darkish stripe like young partridges; and they can look after themselves and fly about wonderfully well at a month old.

THE GREY JUNGLE FOWL - The Grey Jungle Fowl is more beautiful than the Old English Game bantam. In his wild state he is quite plentiful in the south. He is very stylish and has a single comb with eleven to twelve serrations; eyes and earlobes red; tail with only two long sickles, and no long saddle feathers; the hackle is short, with narrow feathers barred white and black, tipped at the ends by a bright yellow spot with a waxy appearance; the shanks are a pinkish red. Hens and young birds are a pale yellow.

THE JAVA VARIETY - The Java Jungle Fowl (Gallus varius) is also a fine specimen, its coloring being a copper-bronze metallic hue surpassing description. This variety differs in many points from other

jungle fowls. The cock has a serration less blue and yellow comb that falls over one side of the face, and only a single wattle, which is red and yellow; he has no hackle feathers, his neck and back resembling that of the common cock Pheasant; he has sixteen true tail feathers, as distinct from the other jungle and domestic fowls which all have fourteen. He has a much more horizontal carriage than other jungle fowls, is narrower, with flatter sides, and has a deeper, narrower breast.

For centuries cock fighting has been a favourite pastime in the Philippines. Many of the birds I saw at Manila, Java, etc., thirty five years ago appeared nondescript; but all possessed Game type with pea or walnut combs and how they were fought in knife-edged slasher spurs.

THE RED JUNGLE FOWL - The Red Jungle Fowl (Gallus ferrugineus) sometimes known as Gallus bankiva is to be found throughout north India to the Chinese Empire and is more numerous than any other breed (I have known two guns to account for twenty three brace in a morning). The Bankiva speaking generally, is very near the black breasted red color of the Modern Game cock; they are small, the cock weighing about two to three pounds, but possesses plenty of flesh which is white and very tasty. They vary somewhat in depth of color according to the district they inhabit, the fowl having broad long, soft, abundant feathers so that the sharp contours of the body are smooth to allow a swift flight without notice. The young birds feather quickly and also put on flesh rapidly, especially the pullets. The cock is a low, drooping bird when moving to and fro in the jungle, and has a most curious gait, identical with that of the Aseel. The males are very pugnacious and the breeding season often fight, at times killing their adversary with their sharp, long, upturned spurs; the strokes are quick and during a fight they rain upon the adversary in speedy succession; there is no cunning mental work in it the aim is to kill or distress the opponent in a rapid short fight.

FOWLS DOMESTICATED BY NATIVES - In one of my rambles in and around the hills of Jailapahar and Darjeeling I saw some of the most peculiar colorings in fowls that a poultry fancier could possibly imagine. These birds were from a cross between the Himalayan pheasants and another species similar to the black game cock. I made enquiries from the natives and was informed that their fowls were obtained from Nepal and from the plains at the foot of the hills. They are kept in captivity until they become accustomed to the place and then let out, being fed with a little seed and the native cake or chapattis. The natives take particular care of these fowls and make a cosy enclosure to entice them in and do their best to tame them. Later the fowls are sold, including the silver and golden pheasant, at three to four annas each.

THE REAL ASEEL - If you wish to see the best of India's birds you must seek out the remote country districts; you will not see them in the towns or cities. Looking over a mutty (mud) wall surrounding an Indian domicile, one will see a couple or so of conical wicker baskets with openings round the top. Beneath these are pure fighting Aseel; they are fed twice daily, some of the feeds consisting of a great variety of ingredients. A good Aseel should have a beak like a peeled almond; bones of neck, small and prominent; back broad; comb, thick and low; jaws and cheeks, large and flat like a stone hand mill; wings held away from body and shaped like a betel leaf; tail, drooping; feathers, hard and narrow. without fluff. Game cocks are never white, yellow or spangle, such specimens being killed off if they do appear in a clutch since they are of inferior stamina. The natives bread from winning cocks of about five years old and a single hen of equal age, believing that the offspring of younger birds are deficient in bone and endurance."

During July 1985 whilst attending a Poultry at Wingham NSW I met Mr. and Mrs. Goody from that area who showed me a pair of Jungle Fowls aged around 10 months. The chickens had been obtained from Mr. Tom Hodgson of Tahmoor, NSW, (who has been mentioned previously in the text) and whom I have known for some years. I had been aware Tom had been working on the making up of the Jungle fowl in Australia. This would be a somewhat difficult project as he would be limited by the material available in the country as our quarantine do not permit the importation of any fowls or eggs into Australia. I was agreeably surprised by the type and colour of the birds I saw when compared with the descriptions that have appeared in the foregoing text of Gallus bankiva. The colour of the male left little to be desired except for the fact the primary wing feathers had no markings, although the secondaries did. Overall I feel Tom Hodgson has done a very good job producing these birds. He would certainly know what he was looking for.

I have heard comments from fanciers that birds that have been exhibited as Jungle Fowls at different shows look like scrubby Black Red Old English Game. May be so, but it must be remembered that they are not supposed to be Old English, although the Old English no doubt descended from them. For the information of my readers the following is a description of the birds referred to from my observations.

Jungle Fowl - Chicks obtained from T. Hodgson, Tahmoor, NSW. Hatched October 1984. Viewed at Wingham Poultry Club Show, 14/7/85. Owned by Trevor and Delma Goody, Comboyne Rd. Killabakh, NS.W. Description of birds:

MALE

Hackle: Orange-red at top to light orange-red. Black striping towards ends of hackle.

Back: Dark orange-brown.

Saddle hackle: Fading to lighter colour than hackle.

Tail: Black to purple.

Front: Black.

Wings: Primaries, black crow wing. Secondaries, front of web marked orange-brown.

Eyes: Light brown-red.

Beak: Black.

Wing-coverts: Dark orange-red, high up.

Legs: Dark to willow.

Female

Partridge body.

Eyes: Darker than male.

Legs: Dark.

Wings: Primaries, dull black. Secondaries, stippled on front web.

Back: Lighter than male.

This description can be compared with previous descriptions in this treatise. Perhaps the reader will find some of the material presented a little contradictory in places. However it must be understood the material that came from different authors at different periods of time will necessarily differ in some respects. I have endeavoured however to put together a cross section of material available which hopefully will give the reader an insight into the Bankivoid and Malay species and I have no doubt should be considered as separate species. I would be pleased to hear from any reader who can add further to this material. Let us now turn to the Asiatics which I further consider another distinct species.



Partridge Cochins. Bred by and the property of Mr. W. C. Forster, Botany, N.S.W. HEN. Winner of 1st and Champion at the United Amoders' Show and 1st Prizes Winner of 1st Prizes at Bathurst, Kinna and Royal Shows. N.S.W.



TYPICAL HEADS. 1. BANKIVA. 2. SONNERAT. 3. VARIUS. 4. SUMATRA. 5. MALAY.









THE CULM OR MALAY COCK OF INDIA. From Cockfighting all over the World Finsterbusch 1929

THE ASIATICS

My grouping of the Asiatics consists of the races of poultry which are the Cochin - Brahma -Langshan all coming from China. Much has been written during the latter part of the 1800's by many poultry authors on these breeds and from what I have read much argument existed as to what was brought from China, India and other places and who brought them into England and the United States.

It is not my intention in this treatise to cover that ground. Much of the material would appear to be of a contradictory nature. Perhaps when I come to writing THE LATER HISTORY OF THE DOMESTIC FOWL I will analyse and summarise it.

At this point of time I am concerned only these Asiatics originated and from what were their ancestors. I must admit there is much for us to learn in this area of study and there is very little material available to work on. It will be difficult to arrive at any positive conclusions unless either fossil remains or-bone recoveries that become available can be identified. Perhaps artifacts that may be unearthed by archaeologists will further our knowledge.

The recent bone recoveries by Professor Zhou at Cishan in Northern China were a valuable asset in our research for answers. Whether these bones were studied at length I do not know. The difficulty is, if they have what can they be compared with apart from Bankiva, Sonnerati etc. Darwin did find a difference which I will speak of later between the Bankiva and the Cochin, but where will we be able to obtain a pure bred "wild" type Cochin or Malay in this day and age for comparison purposes for it does appear Gallus giganteus of Temminck is extinct?

I will however endeavour to put what facts I can before you, then perhaps someone may be able to add to them. Most researchers have found it is most difficult to obtain information from mainland China, although it would now appear the situation is easing somewhat, e.g. Sally Rodwell's mentioned previously has been able to analyse the work of Professor Zhou in recent times and I myself have recently received much assistance from China.

Some years ago whilst researching the history of the Pekin or Cochin bantam I was able to view the Chinese Exhibition which was housed at the Art Gallery of NSW in Sydney, Australia. 1 also received the copy of a paper from Dr. W. Longenecker of the US National Agricultural Library in Beltsville, Maryland, in the US. This paper was also helpful.

I wrote of this information in my book THE PEKIN BANTAM IN AUSTRALIA (1982) and the treatise will be included and perhaps enlarged on. Unfortunately the Exhibition artifact that I was interested in dated only back to 4th century AD. This date is nowhere near early enough to gain the information we are seeking here. It does however establish the fact that, fowls with a head likening to a Cochin and Langshan were in existence at that time in China. I have no evidence at the moment whether birds with a pea comb as in the Brahma existed at that period in China.

As will be noted Sally Rodwell's paper stated that bones of fowls had been recovered at Cishan (dated 5000 BC). If we could ascertain the nature of these bones it would perhaps give us a load as to whether they were Bankivoid or Asiatics. It does appear however they are similar to the Red Jungle fowl.

There does not seem to have been any comparison made between these bones from Cishan and the bone structure of the Asiatics. However the details given by Zhou of the bone size points to the fact that they are from a fowl similar to the Red Jungle fowl.

The only comparison I can find is from Darwin's study which is cited by Hutt (1949) "that Darwin found that in Cochins the long axis of the occipital foramen in the skull was vertical, whereas in Gallus gallus it was horizontal." Hutt also states under the heading of Polyphyletic Origin "that a theory put forward is prompted by the differences between the Mediterranean breeds and the Asiatic ones. The latter, including Cochins, Brahmas, Langshans and the Aseel fowl of Malay, differ from the former in having short wings, poor capacity for flight, large size, a wide drooping tail and a rather stolid temperament. Their eggs are brown or tinted, while those of Mediterranean breeds are white."

And again from Hutt: "These characteristics of Asiatic fowls are not found in Gallus gallus, Gallus lafayettei or Gallus sonnerati (Ghigi 1922 has pointed out that some of them are incompatible with the survival in nature and that the Asiatic fowls might have been maintained under domestication while their adapted ancestor became extinct under natural conditions). Whether the present day Cochin shows the characteristics of some extinct ancestor or merely extremes of variations resulting from artificial selection starting with the Red Jungle Fowl is unknown. It is certain, however, that in nature the Cochin and any ancestors like it would have no more chance of survival than the similarly large flightless, and disproportioned Dodo, which became extinct in comparatively recent times. Apart from the more obvious differences between Mediterranean and Asiatics breeds with respect to form and temperament, descendants of these two groups differ in important physiological characters (Hutt 1949)."

Unfortunate it is that Darwin did not study the skulls of the first of the Langshans and Brahmas that came out of China to ascertain whether their skulls resembled those of the Cochin. I am not aware of any facts with regard to this matter as I have not discovered anything whilst sifting through the material available.

Whilst I do not profess to be an expert in the field of genetics and recognise the fact that there is very little positive evidence available, I find it hard to agree that there could be so great a variation between the Red Jungle Fowl and the Asiatics, using the Red Jungle Fowl as a basis and sole ancestor of the Domestic Fowl. I think, and I reiterate very little positive evidence is available, we still have to adopt a realistic approach.

Even in the family Aves, some families consist of a number of different species within that family and this situation is accepted. In some instances the differences within these families are minimal, e.g. colour, beak, feather formation. Yet, when we come to the genus Gallus birds that are so different "as chalk and cheese" as are the Asiatics, Bankivoids, Malays are not considered so. I would suggest that the Asiatics (Cochin, Brahma, Langshan) be considered as a separate species and I would also suggest

for want of a better name they be called Gallus pluma cruris referring to "feather of the leg, shank or shin". This statement may perhaps meet with disapproval, but perhaps also it may encourage someone to do further study on the subject which may lead us to some positive answers.

It must be admitted that the three breeds under discussion all carry the feathered leg trait in varying degree and anyone who has bred Langshans (at least in Australia) is aware of the difficulty in keeping feather from the centre toe.

From personal experience during experiments I carried out some years ago breeding feather legged Pekin (Cochin) bantams with a clean legged breed I found that the feathered leg trait could be considered a dominant, both in the Fl and F2 crosses (inter-se). In the F2 cross there were perhaps 1 or 2% carrying only sparse leg feathering and of course in the F1 crow the feathering was not as heavy as in the original Pekin but it was much better than I had expected.

I have also accidentally some years ago mated a feather legged Pekin with an Old English Game bantam (which would be considered as descending from Gallus bankiva) The resultant offspring came up with feathered legs and from memory more like a Langshan (one of the Asiatics) than an Old English game. Therefore I think we can assume the Asiatic traits can hold their own.

Only in recent times I crossed an Old English Game Pile bantam with a Pekin bantam - the same result again, both with the feathered legs and shape. To add to this: in the aforementioned experiment the cross was a Black Pekin (Cochin) and Light Sussex. About 12% of the offspring resulting from the F2 could have been mistaken for Light Brahma, both in colour and shape - the trait missing was the peacomb of the Brahma. These experiments were discussed in a paper (Plant 1979).

I think this tends to support the argument that when the descendants of the Bankivoids are crossed with the Asiatics the tendency of transmitting the traits leans towards the Asiatics. It should be understood that the Pekin or Cochin bantam was made up by using the large Cochin by Entwisle in England in the late 1880's, early 1890's discussed by (Plant 1982). The Buff Pekin bantam was introduced into England, but deteriorated to the extent that the Pekin had to be made up again in that country.

I cannot however provide an explanation for the Pea comb of the Brahma as against the Straight comb of the Cochin and Langshan. Genetically the Pea comb and the Walnut of Gallus giganteus (the Malay) are linked and perhaps the Brahma could have come by its Pea comb through this avenue, certainly not from Gallus bankiva. The species, Gallus giganteus and Gallus pluma cruris (Asiatics) do have some similar traits, size, shortness of wings etc. and both species could be classified as "runners", not "flyers". On the other hand I have not heard or read mention of Gallus gallus ever showing the trait for Pea comb. Although my argument may not sound very convincing to some of my readers. However I feel it is a basis for further study. We do not now have pure lines of the Asiatics or Malays which first came out of China and South East Asia so any study of today's fowl in these breeds would be of little value.

Therefore I reiterate once again our answers can only come from the palaeontologists, archaeologists or anthropologists who may uncover remains of the fowl in their excavations in China and South East Asia. These remains MUST be studied and compared along the guidelines set out by Finsterbusch (1929). I don't think this has been done to any extent as those involved have probably not been aware of Finsterbusch's work in this field which in my opinion is of great value.

The background in China of the Asiatics is very clouded as really little is known of the three breeds, Cochin, Langshan and Brahma prior to their introduction into England and the United States during the middle 1800's. Much argument followed their introduction as to what they came from and where they came from. I have no intention of covering this territory here as much of the material was inconclusive. However, I will give references that can be used as further reading.

These references however mostly cover the time slot after the birds were introduced to England and the US. I did however do some research myself on the Cochin while preparing my book on the Pekin Bantam (1982). The little I did discover did prove interesting and I am including my findings in this treatise which I consider relevant to this study. It serves to demonstrate the point that information on the Domestic Fowl prior to its introduction into England and the US is riot easy to obtain. Therefore from my book THE PEKIN BANTAM IN AUSTRALIA (1982) I quote the following.

When I first began researching into the History of the Cochin or Pekin Bantam I went about gathering what material I could discover from the early poultry writers. Unfortunately, however this did not tell me all I wished to know. There was absolutely no information available prior to 1860 when the Buff Pekin was introduced into England from Peking, China. A number of writers wrote the same story, with apparently no attempt being made to discover further facts on the breed.

There were in later years some contradictory statements mode, therefore I felt some pretty heavy research was required to sort out some of the facts. My efforts did not reveal a great deal of material of the earlier times and in some instances did not prove terribly conclusive.

However, in this chapter I will pass onto you what I did learn, together with some of my own conclusions. I began searching for information around 1976, and from a request sent to the Tokyo University in Japan did receive from the Librarian Mr. Suzuki photostat sheets from an early Japanese publication on Poultry. Unfortunately it was written in Japanese. Even at this point of time I have not had the copy translated. It may or may not contain useful information.

An approach was also made to the National Library in Peking, China, requesting information. This proved to have a negative result. Mentioning to a correspondent of mine, Mr. Dick Ricketts of Swindon in England that I was searching for information on the early history of the Pekin, suggested that I might write to Mrs. Leonora Hering, of Saratoga, California in the US who he said had come up with a lead on the possibility of the Pekin Bantam being in Europe prior to 1860.

I took his advice and received from Mrs. Hering a copy of the article which she wrote and which appeared in the American Bantam Association Year Book of 1961, together with a smell coloured print of a painting by Jan Steen entitled THE POULTRY YARD which he painted in 1660. This had been used on the cover of the 1961 A.B.A. Year Book. Jan Steen (1626-1679) was a Dutch figure painter, considered second only to Rembrandt. I can vouch for the fact that Steen went into fine detail in this particular painting.

Mrs. Hering, in her article identifies the birds in the painting, describing one of them, and I quote: "and the sixth is for all the world a little Black Cochin". However, when writing to me in 1977 Mrs. Hering felt now after closer scrutiny it is unlikely that the small black fowl in the painting was a Cochin Bantam.

Allow me again to quote from her letter as follows: "The Dutch claim to have had Sea Captains bringing poultry from the Far East long before the English, and some of their claims are borne out by the paintings of another Dutch master, Melchior de Hondecoeter (1636-1695). I have many Museum photocopies-of his pictures of Crested White Polish, Black Breasted Reds, Mottle, White and possibly some Partridge colour are clearly recognisable, but NO Bantams; nor anything like Cochin shape or feathering. I am sure if the Dutch could claim to be the first to have Cochin Bantams, they would. But I have a Dutch Bantam Standard and can read enough Dutch to see that they give the same 1860 story of the Cochin Bantams being brought to England, that was given by W.B. Tegetmeier in 'The Poultry Book', 1867, page 251. This story is in H.H. Price's article from the A.B.A. Year Book of 1953, a copy of which is also enclosed. Again a disappointment. I believe the Cochin Bantams were probably to near perfection in China over many years time, possibly for nobles only, since they were found by Europeans in the Palace grounds. But I doubt very much that records were kept. Our only hope of knowing would be if representations of them appear in paintings, or ceramics known to be earlier than 1860. It will be most interesting to me to know if you get any useful information from Peking. I will watch exhibitions of Chinese things here. Your name of Pekin for these little fellows is much more accurate than our Cochin. It is of record that the originals came from Peking."

I received this letter from Mrs. Hering early 1977, so then set about making enquiries both to the Victorian and NSW Art Galleries as to the possibility of any Chinese artifacts of pre 1860 vintage being in their Collections, which may provide some relevant information. However I received no answer from either of these institutions. I am inclined to agree with Mrs. Hering insomuch that if we are to arrive at any conclusions on the origin of the Pekin Bantam in China, avenues such as she suggests must be pursued. It appears unlikely that very much was written on the subject.

However during 1977 The Chinese Exhibition was open to the public at the Art Gallery of New South Wales in Sydney, and I was fortunate enough to be able to view this collection of art treasures from China, which have been unearthed over recent years. I felt that amongst the collection there may have

been something that would provide a lead in our quest. It turned out that there was; and although a slender lead, coupled with some information I had obtained, of which I will speak presently, did give me a basis to work on.



Fig. 1 Top section of the Celadon pot unearthed at Yuyao, China, 1967.

Fig. 2 East coast of China, indicating possible diffusion.

Fig. 3 From "Treasures of China" - Pottery jar with celadon glaze, excavated from Nanchang, Kiangsi.

The artifact concerned was in the form of a Celadon Pot, ornamented with the head of a Cock. This piece originated during the 4th century AD (Eastern Tsin) between AD 317 and 420.

The pot was 23.5 cm high and was unearthed in 1967 at Yuyao, Chekiang province. The description of the pot from the Exhibition catalogue is as follows: "With dragon shaped handle and cock head spout, it was a prevalent form of porcelain ware of the Eastern Tsin dynasty."

You will observe from the sketch (Fig.1) of the top of the pot, which I copied and enlarged from the catalogue, the likeness to the head of the present day Pekin is evident. Although the beak section is distorted, this being necessary as it formed the spout, one could well imagine how it would appear if the beak took on its normal proportion. Unfortunately, I could not locate any responsible person at the Exhibition who may have been able to provide me with further information. Therefore at the time this lead did not do very much for me.

However, shortly after sighting this artifact, I received in answer to my enquiry on early history of the Pekin, which had been directed to the United States National Agricultural Library, in Beltsville, Maryland. Dr. W.H. Longenecker of the Reference Division of that Institution sent me some photo copies from publications held in the Library. Amongst them was an extract from 'Livestock of China', compiled by Ralph W. Phillips, Ray G. Johnson and Raymond T. Meyer (1945) in which they state: "The chickens of China are a heterogenous (meaning impure) mixture for the most part. Large and small types, feathered and clean legged types, crested and non-crested birds and a variety of plumage colours and comb types can be found in almost any area. Little organised breeding has been done. Chickens are frequently carried from one village to another for presentations to friends and relations as gifts. Many of these remain alive and interbreed with the birds of the village to which they are taken. Consequently there has been much mingling of local types, and most places have quite a mixture.

Observations and discussions with workers from various portions of the country do indicate, however, that certain localities have types that are more or less distinct. A type that is similar to the Cochin is raised in the Yangtze River Valley. It is called Chantung chicken owing to the belief that it originally came from that province. The birds are yellow in colour and have feathered legs. They may or may not have a crest. Mature birds are reported to weigh up to nine 'catties'." A cattie is apparently a unit of weight in China.

From this information we have now discovered that there were birds in the Yangtze Valley area of yellow colour, with feathered legs and they are called Chantung chickens. So, now lets return to the Cock's head on the Celadon pot which was unearthed at Yuyao. Yuyao is situated close to the coast, perhaps 80 miles south of Shanghai and about 250 miles east of the Yangtze River at its nearest point in Chekiang province. Yuyao could perhaps be considered to be in the general area of the Yangtze Valley where the Cochin type exists.

About the Celadon pot originated in the 4th century AD we can assume that there were fowls in that area at that time, and I think you would agree on checking the illustration (Fig. 1) that the likeness to the Cochin or Pekin head on this pot does give us some food for thought. The birds in the Yangtze Valley were thought to have come from Shantung province in the first instance, which according to my calculations would be roughly 500 to 600 miles to the north of the Valley. Peking is further north again, around another 300 miles in Hopeh province. This makes Shantung province approximately halfway between the Yangtze area and-Peking.

Now we have been told that the Pekin came from the Summer Palace in the city of Peking, and that feathered legged birds resembling them existed along the Yangtze River, and also we have discovered from the artifact found in close proximity to the Yangtze area that the heads of the birds were of similar character. Therefore it would be reasonable to suggest that the Cochin or Pekin was originally located in Shantung proving and diffused both north and south into these other areas (Fig. 2).

We are told the original large Cochins and Shanghais were exported from of Shanghai. Perhaps the origin of the Large and Bantams are linked together in China, the Bantams being bred down from the Large fowls. The Chinese, known to be very patient people could have achieved this through a period of time. My argument is of course of a hypothetical nature and more evidence is necessary to substantiate it. However, it does seem logical to me it could happen this way.

The chicken bone unearthed in Northern China in recent times, if studied in detail could throw some light on the type of chickens indigenous to China. Bone structure could perhaps determine at least whether these Northern China birds were "flyers" or "runners". Therefore at this point of time and until such time that some positive evidence is available we will have to be content with taking the history of the Pekin Bantam from the year 1860 when they were first taken to England.

I also discovered in "Treasures from China" the photograph of another Celadon pot excavated from Nanchang, Kiangsi province, depicting a chicken's head (Fig. 3). As the photostat I obtained was not of good quality I have traced it to give the general shape etc.. The comb in the original photograph was quite indistinct. It could have been a triple (pea comb) but I could not be sure of that.

Let us now turn to the Langshan. Although I do not possess the book, nor have I read it, Englishwoman, Miss Croad covered some territory on the Langshan, "The Croad Langshan". However, even without having read its text I don't think it would go back to the origins as we are concerned with in this study. What I do have to offer however is an article entitled, "The Langshan's Amazing History", which was written by Martyn Pierre Gurney, C.M.G. M.V.O. (year unknown). This may have appeared in Miss Croad's book. Although it does not take us very far back in time I feel it is relevant.

THE LANGSHAN'S AMAZING HISTORY - Fowls of the Wolf Mountain that have always been here - By Martyn Pierre Gurney, C.M.G. M.V.O.

In the north bank of the great Yang-Tse River, about sixty miles from the Yellow Sea and a hundred miles from Shanghai, rises the solitary "wolf mountain", Lang-Shan. Entirely wooded, crescent-shaped, it runs in a north-easterly direction, facing to the north-west, the small town of Tung-Chow, buried almost among the rice fields and canals. The mountain has three tops, not two as hitherto supposed. Two at the points of the crescent and one in the centre, the latter protruding somewhat westward, crowned with its beautiful fourteenth century pagoda.

The various buildings belonging to the monastery cover the mountain side on its western face: the monastery farms surround the mountain, the temple dominates the river and the vast plain of Northern Kiang-Su, as far as the eye can see. This part of the province of Kiang-Su, between the dyke on the east, protecting it from the Yellow Sea, and the great Imperial Canal on the west, which connects the Yen-Ho River to the Yang-Tse, north to south, is very thickly populated, in striking contrast to the part of the province south of the Yang-Tse from Shanghai to Nankin. It is a continuous network of rice fields and canals, with here and there a town of minor importance (Chow), small villages and farms. How came it that this wonderful mountain and its Buddhist pagoda were almost unknown to the European inhabitants of Shanghai from 1842 to 1872? Poultry fanciers wonder that the home of the Langshan fowl should have remained almost a mystery from 1872, when visited by Major Croad's nephew, a navel officer taking soundings in the Yang-Tse River on the Langshan flats, up to the present day.

Author's note: Not knowing the date this article was written I cannot ascertain the reference "present day".

A Century of incredible Silence - An official in the Chinese Imperial Service, a traveller, a landing party from a lightship on the flats, approached the monastery, but nobody has ever given us any definite information nor any description of the mountain or of its pagoda. Even the name of the mountain was incorrectly translated. That this conspiracy of silence should have lasted nearly a century is almost incredible. Strange, indeed, is that the writer, a British consular officer, who happens to be a Langshan fancier and a personal friend of Mary Croad, a Vice-President of the English Croad Langshan Club, a President and founder of the French Croad Langshan Club, should have discovered, accidentally in the photographic album of a French consular officer stationed at Shanghai before the war, the only photographic views ever taken of the Lang-Shan mountain, its Buddhist monastery, its monks and the farms surrounding the mountain.

My friend and colleague, Monsieur Georges Soulié de Morant placed at my disposal some photographs and an excellent French map, from which I made a tracing of the Lang-Shan mountain and district, giving details that do not appear in the Admiralty Chart of the Yang-Tse river printed in 1888, and accompanying Miss Croad's book, "The Langshan Fowl". M. Soulié de Morant gave me an interesting account of his visit to Lang-Shan Pagoda and a description of the fowls he found in the court-yards of the buildings on the mountainside and in the farms around, belonging to the monastery.

A Visit to the Chinese Consul - I thought well to call on my colleague the Consul General of the Chinese Republic in Paris, who very kindly gave me, written with brush and ink in Chinese, the correct name of the Lang-Shan Pagoda. He assured me that the Buddhist monks were still in possession of the monastery. He was agreeably surprised to hear from me that his country had sent such valuable fowls to Europe, and he asked for a copy of my recent pamphlet on the history of the Langshan fowl, which he wanted to send to his son who was studying poultry rearing at a French agricultural college - an amusing coincidence.

The Langshan fowl seemed destined to remain a mystery. Like all really good things, was a long and difficult adventure. That part of the province of Xiang-Su which lies north of the Yang-Tse Kiang is thickly populated and easily reached from Shanghai. The fowls that were shipped from that port to England in 1842 were found south of the river, between Shanghai and Nan-Kin. No fowls over came to England from north of the river until February 1872, when Major Croad's first pen of "Langshans" appeared on the scene. None even reached Shanghai before 1862, when a lightship was moored outside the Langshan crossing. Very few indeed found their way down the river in native boats to Shanghai after that date. The shipments made to England and America of the black fowls of Lang-Shan can be counted on one's fingers.

Europeans Never Visited the District - M. Soulié de Morant assures me that the European merchants and residents at Shanghai going up the river to Nan-Kin had no occasion to land and never to his knowledge did land on the north bank of the river near the Lang-Shan mountain. Between Shanghai and Kiang-Yin the Yang-Tse Kiang is very broad. At the Langshan flats it is nearly ten miles wide, and the many sandbanks, covered at high tide or when the river is in flood, render navigation extremely difficult. The only navigable channel for steamers never gets near the north bank until the small riverside village of Chuang-Yan is reached. The sandbanks shown on the map I have traced keep the navigable channel well to the south of the river. The Lang-Shan crossing between the two great sandbanks can only be negotiated by native flat boats, No Europeans had landed at Chuang-Yan before M. Soulié de Morant did with a view to visiting the Pagoda. From Chuang-Yan to Tung-Chow, the only town within sight of the mountains there is no road, only a canal, and tow paths run along its banks. No road of any kind exists in the district. There are pathways only, along the canals and between the rice fields, just broad enough for one man to run along, pushing a narrow plank, fastened to one wheel and having a pair of handles at one end and a small mast at the other, up which a square sail is hoisted when the wind is favourable. This is the only conveyance at the disposal of the European traveller or the well to do native.



Partridge Cochins imported by D.W. Herstine, Philadelphia Burnham's New Poultry Book - 1877



Fishing with Tame Cormorants - The Lang-Shan district is still as untouched by modern progress as it ever was. Living on rice and fish the inhabitants can be seen fishing in the canals with tame cormorants. The small town of Tung-Chow is surrounded by a wall about 9 ft high and its inhabitants lock themselves in within the wall at night to keep out marauding bands. How easy it is therefore to understand that the beautiful black fowls of the Lang-Shan monastery did not come to Europe with the common fowls of Shanghai in the forties, fifties and sixties and that so few ever left the sacred precincts of the Buddhist Monastery and its farms after 1871.

Every Courtyard Containing Large Black Fowls - M. Soulié de Morant tells me he was greatly surprised to find all the inner courtyards of the lower Monastery buildings where the apprentice monks and the servants of the Monastery lived, and in all the farms lying around the mountain and belonging to the Monastery, "beautiful, large, full bodied black fowls with a green metallic sheen", and these only. So unlike, he says the common fowl of the Kiang- Su Province, south of the Yang-Tse which were coarse and lanky, all of uniform colour, brown red, that of the wild fowls he had found in the Chinese forests.

Langshan enthusiasts will welcome the evidence in favour of our beautiful Croad Langshans. This should surely close for ever the old Langshan controversy. A black variety of the Shanghai fowl (misnamed Cochin), the yellow skinned, yellow legged, long shanked heavy boned, vulture hocked common brown red fowl of the Kiang-Su, from Shanghai to Nankin, never did exist save in the imagination of misguided, so-called poultry experts.

To call the pure blooded Langshan fowl a variety of the Black "Cochin" as some did in the early days of the Langshan controversy is as futile as to call the Black Valdarno of the Tuscan Valley a variety of the white fowl of the Leghorn coast.

There can be little doubt that the Buddhist monks building their pagoda in the fourteenth century on the mountain stronghold, had already then selected black as the best colour for these fowls and stock to them favourite colour through the following centuries because not only does black feathering mean pink skin and white flesh but because black was the colour the reigning dynasty in China that preceded the late Imperial dynasty whose representative colour was yellow. Black colour in China is the hallmark of perfection, majesty, honour, greatness. White is the sign of mourning. Hence white fowls, sports of the blacks, are killed or exported. We know from Miss Croad's book that a Jesuit missionary in the Kiang-Su Province sent some White Langshan sports to America in 1886 and 1888. These White Langshans were bred by several members of the American Langshan Club.

The Beautiful Black Breeds of Gaul - The Romans also appreciated the black fowl. They imported them to Gaul. Note the many beautiful original black breeds in Southern France - the Caussade of Provence, the Gasconne of Gascony, the Bresse of Burgundy. Further north in France we find the Géline of Touraine, La Flèche of the Maine, and the Crèvecoeur of Normandy, the Estaires of Flanders. Italy boasts the wonderful little Valdarno, the green legged black fowl of the Arno Valley, so superior in utility points to the yellow legged white of the Leghorn coast.

We now know for certain that the black fowl has been in sole possession of the Lang-Shan Monastery and farms from the very beginning. Miss Croad's statement that the local Chinese questioned as to the origin of the fowls replied "they had always been there" is thus fully confirmed.

Curiously enough the Chinese name of Langshan was incorrectly translated by Miss Croad in her book. She tells us that an official in the Imperial Chinese Service informed her that Lang meant "Two" and "Shan" meant "Hill". Her informant had undoubtedly in his mind the well known name of "Leang Shan", the "Two Mountains" in the Shan-Tung Province well known to Europeans in China as a stronghold of revolutionary brigands. Differences in pronunciation especially in local dialects, are in many cases very slight, and the word Leang which means two, was taken for the word Lang, which means wolf. All the works on poultry very naturally followed suit in calling Langshans the fowls of the Two Hill Pagoda. There true name is fowls of the Wolf Mountain.

The seventy third volume of the "Great Geography of China" (comprising 500 volumes) edited in 1765 states that: For about 2000 years the mountain has been known by the one name "Lang-Shan" (wolf mountain). Before that time each of the five mountain tops was called by its distinctive name. They were the mountains of "The Tower", "The Army", "The Two Caves", "The Saddle", "The Sword Blade" The Pagoda, the Temple and the Monastery are on the middle one, "The Two Caves".

The mountain was called Lang-Shan (wolf mountain) either because it has the shape of a wolf or because at one time a white wolf lived on the mountain. In the fifth year of Cheng-ming of Leang (919 of the Christian calendar) the inhabitants of the district fought a battle there against the inhabitants of Ou (region of Shan-Hai, south of the river Yang-Tse). There is something very interesting in this Chinese description of- the ancient home of the beautiful Langshan fowl.

Happy indeed are the old friends of Mary Croad, veteran breeders of Langshans, who can, like Buddhist monks of the Pagoda that "divides the clouds", enjoy the happiness of "contemplating at the sunset of their lives the beautiful and valuable fowls dedicated to the memory of the great wise woman, the Goddess Koann-inn. One can truly say that the guiding principle of Mary Croad's life struggle for her favourite fowls was the search for truth.

This evidence I offer as a tribute to her memory. A map of the area discussed appears elsewhere. This information was supplied to me by Joe Pehringer, New Berlin, Wisconsin in the US.

Although it may appear to some readers I have digressed by including the foregoing text I do however feel it is relevant. If the story of Wolf Mountain is correct it reinforces the theory that at least one of the Asiatics was bred pure for centuries before Europeans got hold of them, in fact long before Gallus gallus was even sighted by the Europeans in India. The differences between Gallus gallus (Red Jungle Fowl) and the Langshan are so marked that it becomes difficult to believe the Langshan descended directly from Gallus gallus claimed to be the progenitor of ALL domestic fowls. Unfortunately in the

middle to late 19th century the lack of knowledge of genetics and the lack of constructive scientific study by breeders and writers of all Asian fowls introduced into England and America was non existant.

Mendel's papers on the laws of heredity were not discovered until around 1900, although published around 1860. The writers of the time seemed to be more concerned with arguing their own cause and winning the cause. Unfortunately for us in this day and age these arguments left us with very little positive evidence of the ancestry of the particular breeds. No one seemed to be interested in really getting into the nitty gritty of the ancestry problem. Even Darwin, with all due respect, just said ALL domestic fowls descended from Gallus bankiva and left it at that.

I cannot find any reference in the older literature as from what the Red Jungle Fowl descended from, nor the Malay, nor the Asiatics. The only reference was Gallus giganteus Temminck in reference to the Malay. The domestic fowl origins have been sadly neglected, which I feel is a great pity, and as I have stated previously is most important when considering the evolution and diffusion of man himself. I doubt whether the answers will reveal themselves in my lifetime. I only hope my endeavours will encourage others to pursue the subject further.

Whilst discussing Langshans it may be of interest the information from Compton, "The Australasian Book of Poultry" (1899), wherein he discusses this breed and speaks of Mr. McKeown of Sydney NSW, who was recognised at that time (1899) was probably on of the oldest "admirers and exhibitors of the breed in the Colony". Mr. McKeown advised Compton that Langshans were introduced to his suburb of Gordon by Captain Craig in the late 1870's who brought them from China. They were small birds and laid a smaller egg than those of later birds. An improvement was noted with importations from San Francisco, California, to Mr. Cummings of Bondi, another suburb of Sydney. McKeown later imported Langshans from San Francisco and Chicago. The Chicago birds improved his strain. Later he obtained two lots of birds from England but was disappointed with their quality.

THE BRAHMA - The third Asiatic is the Brahma. Unfortunately I do not have very much to offer scientifically to support the case of the Brahma as belonging to the Asiatics. However, there is a point brought up by Compton (1899) which I think deserves mention.

Whilst many writers on the subject claim the Brahma is of Indian origin, Compton is inclined to suggest it is closely related to the Cochin and may be the result of a Grey Chittagong cross over a Cochin which in spite of the bitter controversy that raged in America could be a logical supposition.

Compton classifies the Chittagong as a large variety of Malay. There would appear to-be a closer relationship in many respects between the Asiatics and Malay, e.g. size, shorter wings etc. rather than between the Bankivoids and the Malay. I would classify the Asiatics and Malays as both "runners" - not "flyers" as are the Bankivoids.

However let me quote from Compton as follows: "One strong point in favour of the common origin of Brahmas and Cochins may be discovered in their osteological characters and anatomical peculiarities. The skull of the Cochin is vaulted and arched both from back to front, and side to side, and possesses a peculiarly marked groove, extending along the frontal bone, and these features every anatomist will regard as distinctly marked characteristics. In these same characteristics the skull of the Brahma and Cochin are identical, differing entirely to other pure breeds of fowls, the latter wanting the distinguishing frontal peculiarities, and the remarkable arched or vaulted character of the head found in both breeds."

Compton does not name the source of this information on this matter. However it does lend some weight to the fact of close relationship between these two breeds. It is unfortunate that the same comparison could not have been applied to the Langshan. The Shanghais and Cochins coming out of the port of Shanghai in the early days apparently were a mixed lot and probably accounted for the traits mentioned by Compton being common to the Brahma and Cochin. Perhaps at a later date evidence will surface from the discovery and study of bone from China. I feel that this is where our evidence will come from in the long term. Recent recoveries in that country suggests this line of thought.

The history after introduction of this fowl is adequately covered by John M. Freeman in "Brahma Fowls" - A History of their Origins and of their Introduction into America and England - (MCMLXVII). I would recommend Mr. Freeman's book to anyone interested in the Brahma fowl. I will however quote from it some relevant passages of his summing up of the controversies which arose after the introduction of the breed, particularly to the US.

So from "Brahma Fowls" page 89: "To the Shanghai district of Northern China we owe a great deal in the matter of fancy poultry. That region has given us the Cochin, the Brahma and the Langshan, for the Langshan district, unlike Cochin China is very close to Shanghai. Indeed, its furthest outpost is within two hundred miles of that harbour city. In spite of Major Croad's lamentations, it is a certainty that the Asiatics - Brahmas, Cochins and Langshans - sprang from a common root and were, when first discovered one breed. The early importations of the now three breeds were, until such time as the fanciers had moulded their progeny to patterns of their own liking, very nearly identical in their general characteristics. The only real distinctions were the pea comb on some of the Brahmas and the white, or pinkish white skin of some of the Langshans. Size, skull formation and feathered shanks were the common characteristics, aside from those traits, there was little or no uniformity. All of the early Shanghais or Cochins to give the breed its modern title, show such tremendous variation in type that, by selection, a dozen different breeds might have been developed. Considering the methods and the tendencies of the fanciers of that era, it is surprising that the final result was limited to only three breeds. It must be understood that the Chinese had made no attempt at selective mating, other than a leaning towards large size so that the biggest birds were chosen as breeders. Otherwise grays, blacks, white, reds, buffs and partridge colored fowls were bred indiscriminately, as also were clean legged and feathered, pea combed and single, short fowls and tall fowls and any and every shape of fowl imaginable. Be it remembered that, in the beginning Brahmas came single combed as often as pea combed, and the early Cochins produced enough pea combed progeny of their own to at least insure the admission to the Standard of Pea Combed Partridge Cochins, although they never proved popular and were dropped after a short while. As to the white skin color of the Langshan, it is common knowledge that Old English Game fowls come both white and yellow skinned, so it is certainly not beyond the realm of possibility that the same thing held true with the Cochins."

To quote further: "However, in spite of the wide differences in shape, type and color between the modern Brahmas, Cochins and Langshans, there is a great mass of hard facts to prove that these three breeds stemmed from a single root and that their place of origin was Northern China and confined particularly to that area lying between Shanghai, Nankin and Hangchow, and not one shred of evidence to the contrary."

I have digressed over the last few pages in an endeavour to demonstrate that a case does exist for the Asiatics to be considered as a separate species distinct from the Bankivoids and Malay. It could in fact be considered that the three Asiatics discussed could even be considered as three sub-species of the Asiatics. It appears from Mr. Freeman's remarks that I am not alone in my support of the case.

What remains now is for us to obtain positive evidence from the recent recoveries of chicken remains and those that may occur in the future. That is where we will find some answers.

A NEW AVENUE OF RESEARCH IN TRACING THE ORIGINS - During October 1985 I received from Professor John L. Skinner, recently retired from the University of Wisconsin in the US, the copy of a paper written by Dr. J. Bitgood, also of the University of Wisconsin which has opened a new avenue in the exploration of the origin of the domestic fowl. This paper considers the genetic approach and is way above my head. However I feel it is most relevant to our studies so will quote it to you.

In an endeavour to simplify this paper for my readers and myself I approached a geneticist from our local processing and breeding establishment, Mr. Colin Barker who very kindly assisted me in this endeavour. I am most indebted to all the gentlemen mentioned.

MEMO TO: John Skinner

FROM: Jim Bitgood

DATE: Oct. 15, 1985

In response to our conversation of several weeks ago in regard to the possible monophyletic origin of our domestic fowl from Gallus gallus (Red Jungle Fowl), the following information is provided. Weiss and Briggs (1972) found that the Red Jungle Fowl carried a genetically transmitted viral genome of subgroup E specificity that was indistinguishable from that found in domesticated chickens.

Frisby et al. (1979) reported that domesticated chickens carry the genome of the endogenous retrovirus RAV-0 as DNA Sequences that were integrated into the host chromosomes and transmitted through the cell line. Molecular hybridisation of RAV-0 cDNA showed 80% homology in the genomes of the

domestic chicken and the Red Jungle Fowl. Gallus sonnerati (Grey Jungle-Fowl), Gallus varius (Green Jungle Fowl), ring necked pheasant and Japanese quail all showed less than 10% homology. Further, restriction enzyme digests showed several distinct fragments of DNA hybridisation to chick retrovirus cDNA in both the Red Jungle Fowl and domestic chicken, however no fragments related to the chicken retrovirus were found in the Grey, Green or Ceylonese Jungle Fowl Gallus lafayettei. The authors theorize that the RAV-0 retrovirus was introduced into the Red Jungle Fowl after speciation occurred, but before domestication. Probably within the last million years.

Of further interest, using molecular hybridisation in chicken chromosomes, Tereba et al. (1981) showed that the ev-2 locus, which codes for the prototype RAV-0 genome, is in the middle of the long arm of chromosome 2.

References

Frisby, D.P., R.A. Weiss, M. Roussel and D. Stehelin, 1979. The distribution of endogenous chicken retrovirus sequences in the DNA of Galliform birds does not coincide with avian phylogenetic relationships. Cell. 17:623-634.

Tereba, A., L.B Crittenden and S.M Astrin, 1981. Chromosomal localization of three endogenous retrovirus loci associated with virus production in White Leghorn chickens. J. Virology 39: 282-289.

Weiss, R.A. and P.M. Briggs, 1972. Leukosis and Marek's disease viruses of feral Red Jungle Fowl and domestic fowl in Malaya. Cancer Inst. 49:1713-1725.

And now a breakdown on the preceding by Mr. Colin Barker of Maitland NSW: A retrovirus is simply a class of virus, while endogenous means that the genome (or chromosomes) of that virus had once got into the cells of the chicken and stayed there by becoming part of a chicken chromosome. Once part of a chicken chromosome this part of virus is then inherited by future generations. Apparently it doesn't actually do anything but is simply stuck there as part of the chicken cell.

The 80% homology in both the Red Jungle Fowl and the chicken means that both the Red Jungle Fowl and the chicken have this part of virus in 80% of the individuals. The Grey Jungle Fowl population however has it in only 10% of the individuals.

Restriction enzyme digestion is a method of breaking chromosomes into smaller pieces of DNA. It's apparently the basis of a lot of genetic engineering techniques. By this method they have shown that identical pieces of viral DNA (part of the viral chromosome) exist in the chromosomes of both the Red Jungle Fowl and the chicken, but not in any of the other species of Jungle Fowl.

All this has led the authors to think that this part of virus found its way into the Red Jungle Fowl after it had become a separate species to the other Jungle Fowls (which is why they don't have it) but before any Red Jungle Fowl were domesticated. The presence of identical pieces of virus in the same proportions of individuals in both the Red Jungle Fowl and the domestic chicken suggests that they both have common ancestors in the not too distant past.

The preceding notes certainly do open up new avenues for determining the origins of our domestic fowl and it would appear that the Red Jungle Fowl and the Domestic Fowl do have much in common. However it would be interesting to know what breed of domestic fowl this work was based on. We are, I think, agreed that certain domestic breeds no doubt descended from the Red Jungle Fowl.

If the domestic breed used in this study was in this category, then we could expect the result as recorded. However, if a breed descended from either the Malay or Asiatics were compared with the Jungle fowl, would the result be the same? This would be difficult to ascertain for as far as we are aware there are no breeds of Asiatics or Malay still around in the wild state or any that could be considered pure with any certainty. They would only need a small infusion of the Red Jungle Fowl to have this part of the virus transmitted perhaps to their domestic descendants.

The Red Jungle Fowl I have no doubt is still in its wild state and pure, so therefore a basis to work from. My comments may or may not make sense but I would be interested to hear of any further work in this field of study as it provides us with another avenue of research.

While I have been researching the origin of the domestic fowl over the years it has been most frustrating at times as scientifically so little has been documented, especially the ongoing study of material that has come to the surface. However it does appear that in recent times more interest has been taken in this field of study. Perhaps we have taken too long to get onto the job and many answers may be lost for all time. I sincerely hope not.

THE ARAUCANA FROM CHILE

I spoke of the Araucana in Book 2 CHICKEN BONE RECOVERIES (1984). I would recommend for reading on the Araucana THE ARAUCANA POULTERERS HANDBOOK David Caudill (1975). There has been some pretty heavy research put into the book and it covers many aspects of the breed. However I will place before you Caudill's "Proposed Araucana Classification. To arrive at this classification he consulted with the U.S. Department of Agriculture, Animal Research Center, Beltsville, Maryland. It-states as follows. The names are corrected by Elio Corti as they are in Summa Gallicana (1995).

(1) Gallus Araucanus Ecaudatus Ovi Testam Coeruleus Cornevin and Castelló: non tufted, rumpless. Indian name: Collonca.

(2) Gallus Inauris Castelló: non rumpless, tufted. Indian name: Quetro.

(3) Gallus Araucanus var. Inauris Castelló: tufted, rumpless. Indian name: Collonca de Aretes.

(4) Gallus Araucanus Melas Ecaudatus Ovi Testam Coeruleus Prado and Latcham: tufted or non tufted, rumpless. Common name: Black Araucana. Indian name: Pió.

(5) Gallus Araucanus Vulgaris Caudill: variegated. Indian name: Chileno.

(6) Gallus Araucanus Guatemalensis Ovi Testam Viridis Caudill. Note: classification of this variety must presently be left unclassified owing to the specimens extreme rarity and complete lack of information concerning character identification.

It will be noted that the varieties of Gallus Araucanus is very variable and it is improbable that it is a distinct species as are the Bankivoids, Malays and Asiatics. It is mote likely to be a hybrid, the pea comb, blue egg mutations as I suggested (1984).

It is evident that very little selective breeding has been practised with the Araucanas as can be seen by the above descriptions. To add to this either straight and pea combs can occur, as also tufts and rumplessness. The only trait that appears stable appears to be the blue egg trait. Even that varies - colours being noted are blue, blue grey, grey green, green, green speckled with brown.

Hopefully more information will come to hand at a later date so, until this occurs I would not be prepared to consider the Araucana as a distinct species. I have discussed the European and English species identified from fossil remains in recent times in "Chicken Bone Recoveries" (1984) and its "Supplement" (1985).

To sum up this study on the species I have coalated as much material as I have available. There must be much more around, which I would be glad to hear of. I was most pleased to receive feedback from Book 2, "Chicken Bone Recoveries" (1984) and it will be noted that important information turned up and was published in the "Supplement" (1985). This is what I had hoped for and as time goes on and more books of this series on the "Origin, Evolution, History and Distribution of the Domestic Fowl" are published and sent out further information will come to hand.

Since the beginning of my researches on this subject I have found that when the papers, bits of information etc. are brought together as I have endeavoured to do piece together a story. However this story is far from complete. I hope someone who reads this treatise has something to add to it. I would be glad to hear from them.

I endeavoured to obtain further information of the Mohenjo-Daro discoveries mentioned by Zeuner. My enquiries were directed to Dr. W.H. Longenecker of the National Agricultural Library in Beltsville, Maryland in the US. Dr. Longenecker advised me that "Mohenjo-Daro and the Indus civilization" 1931, Marshall, John Hubert, ed., is housed in the British Museum. Being situated where I am in Australia it is difficult for me to ascertain whether there is any relevant information contained in it which would assist this study.

It ought it may be relevant to finish this section of the treatise with the chapter from A.J. Compton's "Australasian Book of poultry" 1899 on the origins of the domestic fowl, for even at his time of writing, the end of the last century, in Compton's mind there did exist a doubt ALL domestic fowls descended from Gallus bankiva as was the general belief. I might also state at this point that I consider A.J. Compton's writings compare favourably with Lewis Wright, Tegetmeier, Harrison Weir and other

writers of the late 1800's. His book should fall in the same category as those of the aforementioned gentlemen.

Perhaps because of the fact that he was an Australian as I am also I may appear somewhat biased. However, Compton in my opinion used a very practical approach to the subject and was an accomplished poultry artist in his own right. Some of the standards he set down in his book of 1899 had not appeared in the British Standard of the time, and in fact did not show up until the British Standards of the early 1900's. He was still writing articles for the "Poultry" newspaper, published in Sydney up till the 1930's. Some of which I hope to use in histories of Australian breeds which I hope to publish at a later date.

So to Compton: "The origin of our Domestic Poultry is certainly a question of more than passing interest, and, though various theories have been brought forward from time to time, their origin is still a matter of conjecture. Many renowned naturalists (among whom the late Mr. Charles Darwin stood pre-eminent) devoted a great deal of attention and study towards solving the problem of the origin of the Domestic Fowl, but, so far, none have yet conclusively proved their respective arguments. Most, however, agree that there is only one distinct breed of Wild Poultry, viz., Gallus bankiva or Gallus ferrugineus, and that the varieties known to naturalists as Gallus stanleyi, Gallus sonnerati, and the Javanese Jungle Fowl, or Gallus furcatus, are off shoots or sub-varieties of the Gallus bankiva."

Author's note: Gallus stanleyi is another name for Gallus lafayettei.

"Taking Gallus bankiva as being fully recognised as the one wild breed, as to which little doubt exists as being the progenitor of some of our Domestic Poultry, and which is clearly proven by analogy, it is found that this wild breed is widely distributed throughout India, Burma, Siam, Annam, the Malay Peninsula, and the islands in proximity; and, though generally resembling a rather small, low set Black Breasted Red Game Fowl with the tail carried in a more drooping position than the latter, there is still a marked difference in size and colour in the fowl as found in different localities. These variations support the theory that the Gallus bankiva is in reality the progenitor of the major portion of our Domestic Breeds and the sub varieties mentioned, variations of the Gallus bankiva. Strong arguments in favour of this theory are that the Gallus bankiva will breed freely with the Domestic Fowl, the hybrids being fertile with either parent, and will also breed inter-se; and, though the crow of the cock is scarcely as prolonged as in the Domestic bird, the voice of the hen is almost identical with that of the Domestic hen, and, further, it has been proved that the wild breed is quite capable of domestication. That the Gallus Bankiva may or may not be the sole progenitor of our present day Poultry few are qualified to dispute, as any experienced breeder is fully aware what problems reversion will at times confront him if his strain is crossed, and that the variations in any breed owing possibly to climatic conditions and environments, and a sudden infusion of alien blood, will probably account for the sports produced. On the other hand, in examining Gallus bankiva and its three supposed off shoots, one is confronted with the peculiarities and latent characteristics present in our various breeds of Poultry, which seemingly strengthen the supposition that to one or other of the so called sub-varieties, or to still another wild breed quite distinct from Gallus bankiva, they actually owe their origin."

"It is surprising that there should be such a wide difference in shape and carriage between Gallus bankiva and the true Indian fighting cock, the Aseel, more especially as naturalists assert that the former is the progenitor of the Game races, of which the latter is exceptionally typical, being possessed of extraordinary prepotent powers, and marked with a most pronounced characteristic in the triple comb, closely approaching that found in Gallus furcatus, though in structural development quite unlike that breed. The Gallus bankiva invariably possesses a single comb with even serrations, and, though naturalists uphold the theory that the Game tribes are descended from this wild breed only, the wide difference in their structure seems to point that to quite another distinct wild breed they owe their existence. This difference in shape and skull formation is very marked in the Malay fowl, and, according to Temminck, Gallus giganteus is responsible for the latter. If this theory is correct, the origin of the Aseel should not be difficult to determine. It will be noted that the Brahma, Cochin, and Aseel are almost identical in shape of skull, the Brahma and Aseel exactly similar in shape of comb, while at the same time there is not the slightest resemblance in structural development and carriage of the latter with either the Brahma or Cochin. We have repeatedly noticed in certain strains of British Game Fowls both the old fashioned stamp and the modern bird that the cocks, prior to the actual moulting season,

moult out the long, flowing feathers of the neck and saddle, developing a short, close fitting hackle, similar to the hen's hackle of the variety, this being replaced later by the flowing hackle feathers appertaining to the sex of the bird, this same characteristic being found in Gallus bankiva. That in all probability, some strains of Game Fowls are descended from Gallus bankiva seems feasible enough, as the latter breeds freely with the Domestic Fowl of India, the hybrids being fertile with either parent, and also inter-se. This latter is a strong proof of "unity of species". The fact that it is not the whole of the Game tribe that develops the peculiar hackle feathers in the cocks prior to moulting proper, points to the conclusion (in conjunction with other variations) that all are not descended from one common ancestor, and that the yellow fleshed varieties of the Game Tribe are most likely descendants of Gallus bankiva, while the white fleshed varieties are probably descended from some species now extinct, this in itself being the actual progenitor of Gallus bankiva."

"The division in the habitat of the wild varieties is very pronounced, those of the white fleshed being found towards the west, while the yellow fleshed are confined to the south and east. The Rhodian Fowls and those of Media, Chalcis and Persia were noted for the whiteness and delicacy of their flesh while we note that almost without exception the Asiatic varieties are yellow fleshed. As before remarked, the Gallus bankiva, in different parts of India, varies considerably in colour, ranging from a close resemblance to the Black Breasted Red Game to quite a yellowish-brown; the colour of the legs also varies from an olive-green to a brilliant yellow. These differences in a wild breed, in addition to their non-uniformity of size, at once divides this breed into two or more families, thus clearly accounting for the marked difference in their descendants and at the same time explaining the variations in colour and characteristic traits of the race of Poultry which resembles them most closely in shape and colour, and the latter if not carefully mated each successive generation to keep up to the standard of colour laid down will revert in a generation or two to a bird about identical with Gallus bankiva."

"Gallus stanleyi: this wild breed, or sub-variety of Gallus bankiva, is indigenous to Ceylon, Java and the woods of the Western Ghauts, India, and differs chiefly in the cock being a yellowish-red in breast, yellow-orange neck hackle, and bluish purple saddle hackle, the latter feathers being broad and rounded at the extremities. The comb and wattles are red, the comb being tinged with yellow in the centre. The hen of this variety is of a Partridge colour, and her comb is very small. In both sexes the eyes are pearl in colour. The cock of this variety breeds with the domestic hen, but there is some doubt as to the fertility of the hybrids and the pure stock has never been known to breed in confinement. In the wild state the hen lays from eight to twelve eggs at a batch, which are of a tinted colour, mottled with specks of a darker shade. The chickens when hatched are almost identical with the chickens of the Domestic Fowl. This breed is practically identical with Gallus bankiva, though the crow of the cock is somewhat different."

"Gallus sonnerati or Sonnerat's Jungle Fowl is quite distinct from either Gallus bankiva or Gallus stanleyi and is confined to the more southern portions of India, Hyderabad, Mysore and Madras and is often shot for sport, being locally known as Jungle Fowl. This breed closely resembles the common barn-door type of Domestic Poultry, being almost identical in shape and general characteristics with the exception of the comb of the cock which is very slightly serrated and the hen being destitute of either comb or wattles. The plumage of the cock is quite distinct from either Gallus bankiva, Gallus stanleyi or the Domestic bird, the neck hackles being a dark greyish colour, the shafts being golden, the latter expanding at the tips into a flat, horny scale which glistens in the sun. These scales or plates are mostly of a bright orange colour but at times are barred with various hues. In sole specimens the scales or plates on the hackle feathers are in duplicate, one above the other, on the same shaft. The breast and back feathers are generally a combination of grey and bluish dun, though at times some yellow is present in the neck and saddle hackles. The tail is a brilliant greenish-black and the legs and beak, yellow. The hen of this variety is a brownish-drab on back wings and tail; the throat almost pure white, gradually merging into a greyish white on the breast and underparts of the body. The Sonnerati will breed freely with the Domestic Fowl."

"Gallus furcatus or Javanese Jungle Fowl is one of the most strongly marked and peculiar varieties of wild poultry. The head is long and narrow; the comb of the cock is bluish at the base, verging into a violet at the top, and is very small and without serrations. The face is red and the eyes are very prominent and a distinctly marked characteristic is the wattle which is in the form of a single piece of

skin hanging down from the center of the lower mandible. The colour of this single wattle is yellowish towards the earlobes, merging into a dark crimson or purplish shade towards the front. The neck hackle feathers are broad and rounded on the lower edge and are of a brilliant green colour banded with black; these reach well down the back. The saddle feathers of the cock are similar in colour but laced with yellow. The shoulder coverts and wing bows are also similar but edged with golden- green. The wing secondaries are orange-red and primaries, black. The breast, thighs and underparts are almost black with a bluish sheen and the tail glossy greenish-black. The two top feathers of the true tail and also the two main sickles branch out laterally from which the bird derives the name of the fork tailed cock. The hen of this variety has neither comb or wattles. The neck hackle is a greenish colour, the back, wings and tail are brownish-drab; and the throat, breast and underparts are of a greyish colour. The colour of the legs in both sexes from a bluish-grey to a pinky-flesh colour."

"In reviewing the four wild varieties mentioned it seems probable that the original type is still further back and that it may be diverged into various sub-varieties of which these form a part and later on developing into some of the more prominent breeds with which we are now familiar; but it is evident that the wild breed classified by Temminck as Gallus giganteus must have been allied to the progenitor of some of the Asiatic tribes as these breeds distinctly exhibit peculiarities and possess latent characteristics quite independent of either Gallus bankiva, Gallus stanleyi, or Gallus furcatus and in summing up the various theories brought forward as to the origin of our Domestic Poultry it seems feasible enough that the Gallus bankiva is the progenitor of one section of the Game, it being proved that they closely resemble that most typical of all breeds and though another characteristic trait quite foreign to Gallus bankiva, the fork tail of Gallus furcatus is present in many specimens recognised as descendants of the former it rather strengthens the theory that the Gallus furcatus is a sub-variety of Gallus bankiva breeding freely with the latter and thus by this means the characteristic trait is perpetuated and owing to the tendency to reversion present in a more or less degree in every variety of poultry this point is occasionally cropping up and asserting itself."

"Taking Gallus furcatus it will be found that although this breed varies to a great extent with the Domestic Fowl there is sufficient evidence that strongly marked characteristics of the former are frequently met with in specimens of the various breeds of Poultry. The tendency to the single or median wattle is found in some strains of Brahmas. The fork tail is a pronounced feature in the same breed and also in some strains of Game Fowls, more especially the modern type; the presence of transverse bands of purple on the cock's green-black sickle feathers of some breeds such as Brahmas, Malays and Indian Game and some strains of Modern British Game; the purplish-blue comb, warting serrations found in the Silky fowl; the purplish or gipsy face, comb and wattles in Black and Brown-Red Game Fowls; and the crowning fact that if any of the Asiatic breeds are crossed with almost any variety some proportional of the progeny will exhibit the pea or triple comb thus clearly proving that these are latent characteristics which will assert themselves by reversion to the original type of Gallus furcatus. The startling resemblance of the Gallus stanleyi to the Domestic Fowl is perhaps the most striking of all, the chief difference being the peculiar crow of the cock, though breeders are well aware what a vast gulf lies between the crow of the Cochin and that of the Hamburg. One strong feature in favour of Gallus stanleyi being at least the progenitor of some of our Domestic breeds lies in the undisputed fact that in the latter reversion in colour invariably tends towards the red or brown breast in the cock rather then to the black and this point is more strongly pronounced in the Gallus stanleyi than in any other of the wild breeds."

"The Gallus sonnerati has been successfully crossed with the domestic hen, the hybrids breed with either parent and also inter-se; and though this breed is possessed of such peculiar plumage it is astounding how quickly the horny plates of the plumage become absorbed and disappear altogether when crossed so that even though this breed may not have been the direct ancestor of any one variety of our Domestic Poultry it may at the same time be an off-shoot of one of the original wild breeds and although the plumage presents such a marked variation from the normal type it is scarcely sufficient and by no means conclusive evidence of distinct species. In addition to the wild breeds acknowledged some little claim must be allowed en behalf of a bird with feathered shanks and this points to a bird somewhat of the Langshan type as one of the original ancestors of the Asiatic breeds. It is well known that the anatomy of the Langshan is totally different to other races of Fowls and this breed possesses exclusive characteristics which never vary and which are transmitted to their offspring from generation to generation with astonishing fidelity, so that they may be looked upon as being allied to some other and larger wild breed indigenous to Eastern Asia; and as further evidence there are some of the purest strains of Langshans in which a small proportion of the progeny come clear legged."

"The "Jop" or Sacred Bird of China ancestry dates back some centuries before the Roman Game Fowls were known and this is fairly strong evidence that the Asiatic breeds and their off shoots are more or less composed of the blood of some quite distinct variety crossed with either Gallus bankiva or Gallus furcatus. It has been proved how easily the leg feathering of a breed can be perpetuated and equally as how easy to breed it quite out. This lends colour to the supposition that some feather legged breed, probably crossed with one or other of the wild varieties recognised by naturalists produced the Gallus giganteus of Temminck and thus through various crosses and variations became fixed giving us the original stock of Langshans, Cochins, Brahmas, Malays and Aseels. The shape of the skull in the Brahma, Cochin and Aseel though totally different to other breeds may have become fixed owing to some previous variation or by natural selection and preference in mating for generations but even this strongly pronounced characteristic may be bred out quite easily and just as easily brought back again in entirety by the aid of a distinct cross. The evidence available does not allow it to be stated with absolute certainty that the wild fowls recognised by scientists are alone wholly responsible for the different varieties of Domestic Poultry but rather leaves it an open question as to whether there was not another larger wild breed -- the actual progenitor of those now known -- which possibly has become extinct, some of its characteristics being strongly represented in the Asiatic breeds which are quite alien in many important respects to the wild breeds recognised by naturalists as the progenitors of the Domestic Fowl. It will be noted how vastly different the early Cochins and Brahmas were to the present day specimens and though unquestionably the latter exhibit unmistakeable traces of Gallus furcatus blood it is plainly evident that still another variety must have been a part component of these breeds."

"In conclusion there seems little doubt that the various breeds of wild Jungle Fowls indigenous to Southern and Western Asia are quite distinct from a bird of the Langshan type and one has but to remember that as recent as a half century back Brahmas and Cochins closely approached the type of the Langshan, the heavy leg feathering of the Modern Brahma and Cochin being entirely the result of artificial selection and when it is taken into consideration that fowls can be produced in a comparatively short space of time of a distinctly pronounced type and resembling it in no way any of the component parts and if these birds are crossed with alien stock the progeny will immediately revert to the original type in scarcely any marked characteristic resembling either parent though at times there will be some slight characteristic of the original stock present in a modified form (which may be detected on close scrutiny, but not otherwise), it is an almost overwhelming proof of Darwin's 'Unity of Species'."

COMMENTS ON POSSIBLE OCCURRENCE OF PRE-COLUMBIAN CONTACTS WITH THE AMERICAS

Prior to going to press (July 1986) I received from Mr. N. Romanowski Zoologist at the Deakin University in Victoria, some comments which stemmed from his reading of "Chicken Bone Recoveries" (1984). His comments, I feel are relevant to this exercise and it has always been my contention that ideas, thoughts, in fact any scraps of information need to be brought together as I have endeavoured to do. This in turn can stimulate further interest in the subject wherein we all gain in knowledge. The philosophy of a friend of mine is that he claims to be a learner, but says: "once one becomes an authority one ceases to learn". I can do nothing but agree with him. There is my communication from Mr. Romanowski.

"I am very interested in domestication, not just of poultry, but of all domesticated plants and animals. Although I am a zoologist, this is just an interest (my field is mainly marine and freshwater studies), for as you point out, in Australia we are a long way from where the research is being done.

I'd be very interested to hear if you have any new information on Araucanas, or any information you didn't include in your pamphlet. I'd also like to comment on my own interpretation of the information you put so much effort into accumulating.

You have stated that the "blue" egg is a single mutation resulting from the mixture of Asian and American birds. Although this isn't my main area of study, I find this unlikely. The mutation is probably a single event of some kind, and therefore doesn't need a hybridisation between two isolated populations of domestic fowl to create it. It is more likely to have been present in either the American

or the Asian fowls you believe to have been mixed. I'll come back to this point later, as I'd also like to comment on the general consensus (in archaeology) as to how poultry arrived in South America.

All "reputable" references to poultry in South America make the blanket statement that no pre-Columbian chicken bones are known and conclude that these birds were first brought to-South America by the Spanish.

There are some possible pre-Columbian poultry remains but no reputable archaeologist seems to want to examine and date them accurately, and the reason for this is interesting in itself. It is probable that humans arrived many thousands of years ago in the Americas, via Bering Strait. There are number of people who believe the first humans in the Americas may have arrived on the order of a hundred thousand years ago, but there is absolutely no evidence for this.

However, Bering Strait was last exposed on the order of 10,000 years ago. If the last "natives" of America arrived at this time, and if they brought poultry with them, then domestic fowls were domesticated 10,000 or more years ago, which is far earlier than any other animal is known to have been domesticated. I think this is why everyone is avoiding paying much attention to possible pre-Columbian chicken remains -- if they were pre-Columbian, the discoverer would be embroiled in far more controversy than simply proving chickens didn't arrive with the Spanish would suggest.

Of course, there is some possibility of them having been brought in by sea at a later stage, but such efforts at proving maritime contacts as the "Ra" expeditions haven't been very impressive. Personally I would say that if chickens were domesticated in Asia much further back than is presently believed, and a small group were taken across by humans in the last interglacial period (when Bering Strait was dry) this would be the ideal circumstance for a mutation such as blue egg shells to appear. Only a very small population would have been carried, which allows rapid genetic drift to occur (where mutations / unusual genetic effects spread quickly because there is only a small population for them to spread through). In addition if these birds were carried to America (being bred on the way of course) ten or more thousand years ago, there would likely be some unusual mutations, not all of them obvious.

I don't doubt that Asian birds were brought to Chile at much later dates than the original fowls and bred with them but I don't believe that that is likely to be the source of the blue egg mutation.

One interesting comment to add to this -- an article by Sauer (which I am trying to chase up) refers to blue egg laying, black boned chickens in both South America and Asia. However, I have not otherwise heard of any blue egg layers except in South America.

You have mentioned a theory which has never been researched, which is that the blue colour is a result of losing the red from brown colouration.

However, the blue colour is a separate mutation altogether -- brown and tinted eggs have the colour on the surface only -- it is deposited after the egg is formed. The blue colour, however, is a part of the entire egg shell, so it is a mutation of the egg shell forming parts of the oviduct and not just added after. I might also add that no combination of red and blue gives anything like brown."

Mr. Romanowski's comments interested me more than somewhat, particularly his comments on the Araucana's Blue egg. I appreciate any comments on my writings as I feel it stimulates me in seeking further information on the particular subject.

I had recalled reading a paper on the Blue egg some years ago and on searching through my files came up with this paper which was written by R.C. Punnett M.A. FRS. in the "Journal of Genetics" Vol. 27. No. 3 August 1933. It was entitled, "Genetic Studies in Poultry"-- "The Blue Egg'.

Professor Punnett needs no introduction to students of genetics and his work in the field of research on the Domestic Fowl is well known. In this paper he quotes C.A. Finsterbusch from the article "The Araucana, the Blue egged Fowl of Chile" which appeared in 'The Feathered World" August 28th 1931.

He quotes Finsterbusch as saying he, Finsterbusch, considered that it has been fairly proved that there were no fowls before the advent of the white man in South America. Finsterbusch brings forth evidence that the Spanish poultry originally imported were subsequently reinforced by Balinese birds through the efforts of Dutch pirates, and points out that birds of typical Oriental types are common among the mongrel population of Chile. Further, he makes it clear that the fowl population of Chile is just as mongrelised in respect of egg colour as of structural features and plumage. Commenting on the "blue" egg, he states that these strange coloured shells are however, by no means of uniform tint. They

are bluish, blue grey, purplish, greenish, greyish green, and, finally greenish eggs speckled with brown, which indicates clearly some precedent colour influence, either abnormal or incidental. Finsterbusch suggests that the greenish and bluish shell colour is due to loss of the red pigment brought in by the imported stock from Bali. As will appear later, this explanation does not accord with the genetical data.

Professor Punnett goes on to say he acquired three Chilean hens in the summer of 1930 through Mr. Claud Elliot who had brought them over to England direct from Chile. They differed greatly in plumage colour and structural features. One died soon after arrival but the two survivors both laid blue eggs.

I will not go into details of Professor Punnett's experiments in which at various stages he used Gold Pencilled Hamburg, Welsummer and Light Sussex with these Chilean hens and their offspring. He sets out the results of his research and experiments in some detail.

Punnett again states: "These experiments show that although "blue" and "brown" may be combined to give "olive", they are nevertheless transmitted independently. And here may be considered the manner in which these pigments affect the shell. The blue shell is blue throughout. This is at once apparent when the shell membrane is stripped from the inner surface of the shell. Moreover, the green and olive eggs also appear blue when viewed from the inside. This permeation with blue renders the shell much more opaque, a fact at once noticed when the eggs are "candled" in the early stages of incubation. On the other hand the brown pigment is superficial, and presumably only laid down during the last stage in the passage of the egg along the oviduct. The various shades of brown are dependent upon several genetical factors as yet incompletely analysed. As the blue factor entered into the composition of the domestic hen we can offer no plausible suggestion. None of the wild species of Gallus lays an egg which can be supposed to contain it. Among the true pheasants (Phasianus) judging by the recorded colours of the eggs, it is to be found in some species though not in others. It is well known that hybrids can be readily obtained between the pheasant and the domestic fowl, but hitherto such hybrids have proved to be sterile. It cannot, however, be said that the matter has been fully explored, and it is conceivable that at some time or other fertile offspring may have been produced. But in that case one would expect to find some evidence of this among the domestic fowls of the East Indies. In its absence we can only suppose that the blue egg arose as a dominant mutation among those imported from Asia by the Dutch."

Summary: "The blue egg character, common among fowls in parts of Chile, behaves as a simple dominant to non-blue. Combined with various shades of brown it gives a series of greens and olives. Polychromatism in fowls and pheasants eggs follows apparently similar lines."

Although Professor Punnett wrote this paper in 1933 and conducted his experiments just prior to that time, his statements are still certainly relevant for I have not noted any further work along these lines which would pinpoint the origin of the blue egg. Unfortunately I had forgotten about this paper of Punnett when putting forth my hypothesis on the possible origin of the blue egg in "Chicken Bone Recoveries" (1984). Perhaps it does strengthen my argument. However one thing that I do find constantly happening in my research is that from many comments I receive, a new avenue opens up to explore.

97

The quest for the answers is neverending but however does present a challenge. It will be noted on page 41 I mentioned the fact that I had either heard or read somewhere that in earlier years experimental work in crossbreeding had been carried out in Ceylon (now Sri Lanka). I believed the results of these experiments had been published somewhere, but had no idea of their nature or what journal was involved.

Only very recently (1986) as I was completing this manuscript I received a visit from a fellow researcher, Mr. K. Fenwick of Tully in North Queensland and during our discussions he advised me he had a copy of the journals containing details of these experiments. He very kindly supplied me with a copy of the following article which summed up the results of 3¹/₂ years work in this field. It was dated October 1st, 1906. It will be noted that the Ceylon Jungle Fowl is referred to as Gallus stanleyi. As mentioned previously Gallus stanleyi is synonymous with Gallus lafayettei. I feel this article does have some importance. It is unfortunate more work has not been done along these lines. So from the

"Supplement to the Indian Fowl Fanciers' Gardeners' and Farmers' Journal" of October 1st, 1906 comes the following.

CEYLON NOTES

CEYLON JUNGLE FOWL EXPERIMENTS

Success at last hybrid breeds with hybrid - After 31/2 years' work

In August two Jungle hens were purchased and placed in the Queensdown experimental run, making in all one hybrid cock, one hybrid hen, and two jungle hens. The jungle hens had already been in captivity up country for six weeks and were remarkably quiet and tame. The hybrid cock would have nothing whatever to do with these hens. In fact, so badly were they treated by both the hybrids that they had to be removed. They were taken over by the Maha Mudaliyar for his experimental runs.

The hybrid hen has since laid seven eggs, and these she incubated herself. On the 3rd September 1906, one of the eggs was found to be hatched out, and a lively little chick was in the nest. The remaining six eggs were clear. The hybrid hen, after many weary sittings on infertile eggs in the past is now proud mother of one chicken. A great achievement indeed; for this one little chick upsets a good many things.

The last issue of Dr. Willey's "Spolia zeylanica" contained an article on "The Hybridisation Experiments with the Ceylon Jungle Fowl". This article brought the history of the experiments up to 1st June 1906. The writer, in discussing the experiments of breeding hybrid with hybrid says: "This experiment is the crux of the whole problem before the experimenters. It was the experiment Mr. Mitford tried, and he failed to produce chicks. It was the experiment that led Darwin to conclude that the hybrids of Gallus stanleyi were sterile. If the experimenters could only breed from this mating the whole question would be settled at once and for ever, and the little Ceylon jungle fowl would have the honour of being acknowledged a parent stock. The result so far has been a complete failure to produce chickens."

The above is now no longer the state of affairs. This chicken is the progeny of the hybrid cock mated with the hybrid hen. It upsets the value of Mr. Mitford's experiments, which formed the basis of Darwin's opinion. It shows that Mr. Mitford's negative results merely proved that he did not succeed where it was possible to have succeeded.

It upsets the theory that the Ceylon jungle fowl and the domestic fowl are not of the same species. The breeding of the hybrids inter-se shows that they are one and the same species. It upsets the opinion expressed by Darwin on insufficient data that "This species may in all probability be rejected as one of the primitive stocks of the domestic fowl". There is now no doubt that this species, the Gallus stanleyi, is one of the primitive stocks.

The Ceylon jungle fowl must henceforth share with the Gallus bankiva the honour of being one of the parent stocks of domestic poultry. The Ceylon jungle fowl should be able to breed with the Indian jungle fowl (Bankiva) and produce fertile progeny.

It has been more than once stated that native opinion in Ceylon held that the hybrids were fertile with domestic fowl, and never considered that the hybrids would not breed inter-se; but the opinion had never been proved with scientific accuracy. The result of the present experiment proves that the native opinion was quite sound.

The sole object and purpose for which the jungle fowl experiments were inaugurated, has been achieved after some three and a half years' work. It is a matter of no little satisfaction that something has at last been accomplished. The continual reports appearing month after month in the Ceylon Poultry Club Magazine of the failure of the hybrid eggs to hatch out was getting very monotonous and it seemed that the result of Mr. Mitford's experiment was the correct thing and the truth. This one chick, however, proves that the hybrids are fertile when bred with one another. One swallow does, sometimes, make summer. The circumstances that gave hope of success about this mating was that in one or two batches of eggs two or three have been found to be addled, pointing to these eggs having been fertilised, and further in March last one egg out of a batch was broken open and found to contain a three-quarter developed living chicken. Had this egg not been broken, there is no reason why it should not have hatched out at full term as has been done in this last sitting. In such case it will be observed that there was only one egg with a chicken, while all the other eggs of each batch were clear. This is a curious and inexplicable fact. The appearance of this hybrid - hybrid chick - is a whitish grey

with dark streaks on the head and along the back, just like any common little game chick, while the legs are yellow in colour. Its movements differ from those of the domestic chick. If startled, it darts about; it runs much more swiftly than any ordinary ever does, and in this respect is very like the wild jungle chick"

J. LLWELLYN Thomas, F.R.C.S. Colombo, Ceylon.

These final pages of this treatise may seem a little hotch potch to reader but I make no excuses for this. As I came towards the end of the manuscript I decided to go through my files of material, which I have been collecting for some years to ascertain if among them there was something I had missed. or forgotten about. I did in fact find material which I thought relevant, although covering different aspects of the study.

However, the nature of this exercise has been to collect as much data as could be located, put it together so that it could be analysed, which in turn could lead us to some of the answers we are seeking. Amongst this material I did find something relating to the preceding article; i.e. further information on the cross-breeding of the Ceylon jungle fowl leading up to the final conclusion which you have read.

Although it was published in 1907, obviously the writer was not aware that a conclusion had been reached in 1906. However it does prove interesting. Also from the pen of W.B. Tegetmeier (who was a great friend of Darwin) comes his very strong argument that everyone else was wrong and he and Darwin were the only ones right regarding the single ancestry of the Domestic Fowl. There is also a little on the Onagadori fowl of Japan and a short article from the World Poultry Congress of 1962. This, as I said, makes the end of my story seem a little confused, but does at least make "more meat for the sandwich".

THE CEYLON JUNGLE FOWL

Taken from the journal EMU Vol. VI. 1st January 1907

Author unknown

The conclusions arrived at by the great naturalist Darwin were that the progenitor of our races of domestic fowls was the Jungle Fowl of India (Gallus bankiva or sonnerati), and that the other three species of Galli had no lot or part in modern poultry although the evidence was very scanty so far as the Ceylon Jungle Fowl (Gallus stanleyi) was concerned. From time to time doubts have been expressed as to the position assumed by Darwin, more especially in Ceylon, where it was claimed that the wild fowl of that country interbred with the common hen. With the object of obtaining further evidence on this question, the Ceylon Poultry Club commenced in 1903 a series of experiments, which have just been brought to a conclusion, the results of which are published in "Spolia Zeylanica". Great difficulties were experienced, chiefly in the direction of securing wild birds and taming them sufficiently to be kept in enclosed runs. Attempts have been made to produce the hybrids both ways -- i.e., by mating the jungle cock with domestic hens, and by the domestic cock with jungle hens. The latter way was a complete failure. On the whole, it was found that the jungle cocks seemed to be more amenable in captivity than the jungle hens. Many of the wild birds died within a few weeks after they were captured, generally about the fiftieth day. Eggs taken from the wild hens nest hatched badly. After many trials, some of the jungle cocks were secured and kept alive long enough to be bred from. They would however, only consort with one hen, as they monogamous.

Seven different matings with hybrids took place, the results of which are very suggestive. From the crossing of the jungle cock with domestic hens several of the hybrids of both sexes were reared, which were utilised for further experiments. First, between a hybrid cock and domestic hen. In every case fertile eggs have been produced and strong healthy chickens hatched out. Secondly, a hybrid cock with a hen produced from the first lot, which may be said to be one-fourth jungle and three-fourths domestic. This also proved successful, as chickens were reared. The test of the experiment was mating a hybrid cock with a hybrid hen, for if that could be achieved the question would be settled in favour of the Ceylon Jungle Fowl being regarded as a parent stock. It was failure in this direction that led Darwin to his conclusion. To that extent the great naturalist has proved correct, as not a chicken has been obtained from this mating. "Each hen has laid several clutches of eggs, and the eggs have been incubated by the hybrids themselves and by other hens, but no chicks. The great majority of the eggs

have been infertile; only in one or two instances have two or three of the eggs been addled, which points to the eggs having been fertilized". Other experiments gave the same results but whenever the jungle or hybrid cock was mated with a wholly or partly domestic hen chicks were obtained. "The mating of the domestic male with jungle female gives a negative result. That of the jungle male and the domestic female gives the hybrids, male and female. The hybrid female mated back to the jungle cock gives negative results", as does the mating of the two hybrids.

This valuable and interesting experiment, which it may be hoped will be continued on a more extended scale, proves that the hybrids will breed under certain conditions, and would indicate that the Ceylon Jungle Fowl has probably exerted some influence. But it does not afford sufficient evidence to lead us as yet to accept it in any way as responsible for our races of domestic fowls. That opens a wider question which has not been touched. This text originally came from "The Times" - 28th September, 1906.

The foregoing was apparently written before the writer was aware of the final result of the experiment i.e., the hatching of the single chicken was made known. By scrutinising the dates mentioned in the text this is understandable. However, overall the information is both interesting and important.

Let us now turn to W.B. Tegetmeier's comments from the "Poultry Book". My copy (1867) did not contain this text in full that I have reproduced. I feel it may have come from a later edition. So from Tegetmeier "The Origin of the Domesticated Varieties of Fowls - The Jungle Fowls": "There is perhaps no subject in the whole range of Poultry literature on which more absolute nonsense has been written than on the origin of the different breads of our domesticated poultry. In place of making any accurate scientific investigation into the facts of the subject, the majority of writers on poultry have adopted certain theories, and endeavoured to prove them by the most ridiculous statements, which they have gravely put forward as truth. If any naturalist wishes to read the absurd fancies of the compilers of treatises on poultry, we would advise him to turn to the chapter on "The Wild Fowls of India" in Messrs. Wingfield and Johnson's Poultry Book.

It is stated that the Kulm cock of India, or St. Jago fowl, the Gallus giganteus of Temminck (a breed which is a domesticated variety nowhere existing in a wild state), is one of the races of wild Galli to be regarded as the forefathers of our poultry yard. We are also informed that the Jungle fowl consists of two distinct species", the Bengal Jungle fowl, and the Sonnerat Jungle fowl, and that the Gallus stanleyi (which is in reality the wild fowl of Ceylon, and a perfectly distinct species) is a variety of Sonnerat's fowl.

Although jungle fowls are said to be of two distinct species, the writers state that many of our present breeds of fowls may have been derived from these four species - Gallus giganteus, Gallus sonnerati, Gallus furcatus and Gallus bankiva - we have little doubt. But still these are not necessarily to be regarded as the sole ancestors.

After this definite statement, one would hardly expect to find on the same page that Gallus furcatus seems to possess no tie that might connect it with our domestic race. Such are the blunders of compilers who write on subjects on which they are perfectly ignorant. Amongst other ridiculous statements in the same chapter, is one that the Black-red Game is descended from the Bengal Jungle fowl, and the Duckwing from the Sonnerat, the authors, or rather compilers, ignoring the facts that Black-red Game fowls may be bred from Duckwings, and Duckwings from Black-reds; in fact these birds are habitually reared in this manner, as may be ascertained by reference to the chapter on Game fowls in the present volume."

Author's note: As will be noted Tegetmeier's criticism of Wingfield and Johnson is quite severe. Apparently Tegetmeier's problem was that someone disagreed with his own ideas. Tegetmeier at that point of time really had no more positive evidence that anyone else. There is an old adage that states "That he who casts the first stone should be free of sin".

Wingfield and Johnson's reference to the Duckwing is perhaps not so much nonsense as Tegetmeier would suggest, for I would like to quote from "Genetics of the Fowl" - F.B. Hutt - 1949 wherein he says: "Apart from the possibility that some extinct ancestor may have given rise to the Asiatic breeds, there is good evidence that all four of the existing species of jungle fowls may have contributed to the domesticated population. Hybrids between any wild species of Gallus and the domestic fowl are fertile. In some of these cases fertility may not be so high as in matings of domestic fowls, but that would not

prevent a contribution to the common stock from any species. Attempts have been made by some writers to ascribe certain characteristics of domestic fowls to the various wild species from which they might have come. While both golden and silver varieties are found in several domestic breeds, Gallus gallus apparently occurs only in the reddish golden form and silver variants have not been described. It is easy, therefore, to conclude that the silver gene of domestic breeds came not from Gallus gallus but from Gallus sonnerati, in which no golden variants are found, all specimens being undoubtedly grey or silver. Similarly, the extended black plumage (solid black) can be attributed to Gallus varius and yellow shanks to Gallus sonnerati. Unfortunately the descriptions thus far available of the different wild species and of their offspring following crosses with domestic fowls are in terms which permit recognition of only a few of the genes-known to occur in the domestic fowl. Apart from this, the fact remains that pea comb, rose comb, dominant white, polydactyly, crest, and many other genetic characters of domestic breeds have arisen by mutation since fowls were domesticated, since they do not occur in any of the wild species,. Presumably those which are found in existing wild relatives of Gallus gallus could also have occurred by mutation in descendants of that species since domestication."

Underscoring by W.J. Plant. Now back to Tegetmeier: "Leaving the absurd conclusions of the mere bookmaker for the investigations of men who are of the highest authority as observant naturalists, we arrive at a totally different conclusion. The most eminent naturalists of the present day, working independently of each other, and regarding the same facts from different points of view, have come to a similar conclusion respecting the origin of our domestic breeds - a conclusion that must be acquiesced in by all who have studied their premises. It is that there is but one species from whence all our domesticated varieties have descended, and that that species is the common red jungle fowl, the Gallus ferrugineus, of India. The late Dr. T.C. Jerdon, the author of that admirable work, "The Birds of India"; Mr. E. Blyth, whose opportunities for personal investigation into the history of these birds has been unusually great; and Mr. C. Darwin, whose attention has been devoted for many years to the study of the subject of variation in our domesticated animals, have all independently arrived at this conclusion.

The facts on which their inferences are based are too numerous to be detailed at length in a work of the character of the present day volume, but they may be briefly alluded to. In the first place, no one of the numerous domesticated varieties exists in the wild state; the forests of the tropical world know no such fowls as the Kulm cock, the Silky fowl, the Cochin, the Frizzled, the Bantam etc. etc. as is so constantly stated by writers on poultry. Such being the case, we must either imagine the origin of our domestic breeds to be some species that no longer exists in the wild state; - or to be some existing wild species; - or to be the result of crosses between several existing wild. species. The first supposition is most improbable. We know that the jungles of India offer to birds by far too secure an abode for us to imagine that the original breed of poultry has been exterminated. The improbability that our breeds are the results of crosses between two or more species has been already alluded to. The investigations of Dr. Salter, which were detailed at length in the "Natural History Review", prove most convincingly that the hybrids so produced are deficient in fertility, and that the cross bred races soon die out, even under the most favourable circumstances. Moreover, their plumage is unlike that of any domestic variety. Hence we are reduced to regard the common Jungle fowl, the Gallus ferrugineus of Gmelin, as the original species from whence all our varieties are derived.

To the minds of persons unaccustomed to study the extent of variation in species, this conclusion may appear very forced and unnatural. That the Cochin and the Bantam, the Game cock and the Silk fowl, had but one origin, seems at first sight incredible; but the existence in other species of animals, of varieties as diverse as these is universally acknowledged. The gulf between the European and the Negro or that separating the Turk from the Tasmanian, is as great as that between any two varieties of fowls. The toy terrier and the gigantic St. Bernard are as diverse as any two gallinacean varieties. The researches of our most experienced Indian naturalists all tend to prove that the genus Gallus contains but four known species namely:

- 1. The Gallus ferrugineus, or Gallus bankiva, the Jungle Fowl of Continental India.
- 2. The Gallus stanleyi, or lafayettei, the Ceylon Jungle Fowl.
- 3. The Gallus sonnerati, Sonnerat's Jungle Fowl of southern India.
- 4. And the Gallus varius, or Gallus furcatus, the fork tailed Jungle Fowl of Java.

As the first of these, the Gallus ferrugineus, is regarded as the wild original of our domestic breeds, it is desirable that we should possess a detailed description of its form, plumage and habits. For this purpose we take the liberty of compiling, with some additions from Jerdon and other authorities, the following account of the Jungle fowl, mainly from the pen of a well known Indian ornithologist, who has published the results of his observations in "The Field" under the signature of 'Ornithognomon'.

The common Jungle fowl of India is the Gallus ferrugineus of Gmelin, the Gallus Bankiva of Temminck, the "Bunmoorgh", or "Jungle Moore", of the Hindustanis, "Bunkookra" (Bengali), "Geragogor" (Gonds), "Natsoopia" (Botan), Paroktshee (Lepehas of Dorjelling), "Beer seem" (Koles), "Tanquet" (Burmese), "Ayamootan" (Malay), "Brooga" (Sumatra), "Bengkicoo", or "Bengkeeko" (Javanese).

The cock measures, from the tip of the bill to the tip of the tail, about 26 inches; 2 feet 3 inches across the stretched wings; the length of the closed wing is from 8 to 9 inches; the tail measures 15 inches; the leg or tibia is 4 inches long; the tarsus or shank, 3 inches; the middle toe, 13/4 inches; the spur 1 to 11/2 inches; and the weight of the bird is about 21/4 pounds. The hen is only 1 foot 5 inches long, the length of the tail 7 inches, and the wings spread 2 feet.

These dimensions, which are taken from average sized specimens, show how domestication and feeding have increased the size of our common breeds, some of which rival the turkey in size. The following are the points indicating the pure wild breed: The form is bulky, broad across the back and shoulders, the bird standing high and very erect, with protruding breast and a nearly horizontal tail, the tips of the centre feathers of which barely clear the ground. The plumage is thick, and the feathers of the neck and upper tail coverts are linear, pointed, and drooping. Head and face bare, with a small circular patch of feathers over the ear hole. The comb is high and serrated, rising from nostrils and overhanging the occiput. There are two wattles under the base of the bill, and a smaller pendulous flap under each ear; in the female, both comb and wattles are rudimentary. The bill does not alter in domestication. Legs are stout, rather lengthened, with a single row of scales in front, and a double row behind, the sides of the leg being reticulated. Toes rather short, and webbed to nearly their first joints; a large spur on the inner side of the shank, about three quarters of an inch above the thumb, attaining a length of one inch and a half in old birds. The wings are short and bowed; the quill feathers suddenly narrowed from near their bases; the fifth and sixth primaries are the longest; the secondaries very little shorter. The tail is composed of fourteen feathers, shaped as in the barndoor cock, but not held so erect.

In the cock, the iris is orange; the bill horn-colour; the legs blackish-lead colour, with a slight green tinge; the face, comb, wattles, and throat fleshy carmine; neck and head feathers bright orange, pale and golden where flowing over the back; the feathers at bottom of neck black at the bases; back, rich deep vinous rust colour; lower back and upper tail coverts fiery orange, the latter golden tipped; tail and its longer upper coverts, or sickle feathers, black, glossed with green; wing coverts like those of the back, but the two last rows a black, glossed with green; the secondaries chestnut on the outer web, and dusky within; the primaries dusky; all the lower parts black; the ear coverts are white in the Bengal birds and orange rusty in the Burmese and Malayan varieties.

The hen has the skin of the face a paler red than in the male; legs livid horn colour; crown, ear coverts, and throat vinous rusty; rest of neck golden tawny; each hackle is centred with brownish black, and the larger ones are shafted with tawny colour within the black. All the upper parts are full burnt umber brown, the feathers vermiculated and centred sepia, with pale tawny shafts; the side tail feathers are plain sepia, as are the inner webs of all the remiges; all under parts vinous reddish-brown, the shafts pale; primaries and their coverts plain sepia, with the outer margins ashy.

The breast and underparts of the young cock birds are much broken up with rusty coloured feathers, and in the first moult both sexes are similarly coloured mottled brown, with dusky wings and tail; when first hatched, the chicks are covered with cream coloured down, and have sepia coloured bands along the centre of the head and through the eyes.

Every poultry fancier will at once recognize the fact, that all our domesticated varieties, the breed which most closely resembles the Jungle cock in colour, form, and carriage, is the Black breasted Red Game. If the tail of a small Game cock of this variety were depressed so as to be carried horizontally, it would

be difficult to distinguish the bird, provided it had not been dubbed, from the descendants of its wild progenitors, and now roaming at large in the Indian jungles.

The Jungle fowl is found all over Continental India wherever jungle exists - to the westward, as far south as the Vindhian range and the Raj-peepla Hills; to the eastward it extends in the Madras Presidency as far as the Godavery, where it meets with Sonnerat's Jungle fowl, individuals of the two species frequently inter-breeding. It is more abundant to the eastward of the Ganges, through the vast Teraij and Morung forests, Dacca, Silhet, and Chittagong; and, further south through Arakan, Burma, and Tenasserim, Malayana, and the islands of the Archipelago as far as Timor and the Benin Isles. All the individuals in the Indo-Chinese countries are subject to trifling variation, having the ear coverts red or rust coloured instead of white. The birds found in the Cis-Himalayan range are said to be paler coloured than those farther south.

In India proper - writes Ornithognomon - I have found this bird more numerous to the south than to the north of the Ganges. It is off the alluvium in the dry, stony jungles between Midnapoor and Chota Nagpoor, that the Jungle fowl are met with in great numbers. In favourable situations, such as the narrow strips of cultivated land in the woods, I have, after the crops have been reaped, seen as many as twenty or thirty together gleaning about in the stubble; and where the country is thinly inhabited they will, in twos and threes, advance pretty boldly into the open. They are at times excessively timid and wary. When approached in open spots, far from covert, they take as readily as partridges, springing with a loud flutter, and flying steadily and strongly to the jungle, with rapid beats and alternate sailings of their wings. They alight generally within the edge of the covert, and then run so long and swiftly as to render it quite hopeless to follow them. There is no bird more difficult to approach, or even see, when in the jungle. The cocks may be heard of a morning or evening crowing all round, but the utmost precaution will not, in most cases, enable the sportsman to creep within shot or sight of the bird. The hen too, announces the important fact of having laid an egg with the same vociferation as in the domestic state, but is silent ere the stealthiest footstep can approach her hiding place, and gliding with stealthy feet under the dense foliage, is soon far away in the deep recesses of the jungle. To a stranger, it is not a little curious to hear the familiar sounds of our farmyards issuing from the depths of the wild forests. The crowing of the cocks, the cackling of the hens, the chirruping of the chickens, are precisely the same as we have been accustomed to ear since the earliest dawnings of our intelligence, and, associate as the homely sounds are with civilization and domestication; they appear out of place in the solitude of the jungle.

Owing to its secluded life, the breeding habits of this bird are very little known. A question has arisen amongst naturalists as to whether the cock in its natural state is monogamous. I am inclined to think the latter, from seeing always so many hens to one male bird, and this in every season of the year. The information I have gathered from birdcatchers, who are in the jungles during the twelve months, certainly confirms the above conjecture. The period for incubation varies according to locality, but is generally at the beginning of the rains - i.e., June. I have seen eggs, however, in March, and Jerdon says the hen breeds as early as in January and as late as July. She selects for this purpose some secret thicket in the most retired and dense part of the jungle, scraping together a few leaves on the ground by way of nest. She remains as part of the cock's seraglio until some seven or ten or a dozen eggs have been deposited in the above spot, to which she stealthily repairs every day, and finally quits her party and retires alone and unseen to perform the duties of incubation. The chicks are hatched, as usual, in about twenty days, and follow the mother soon as they have emerged from the eggshell; and she leads them about, teaching them how to find their own sustenance, till they are big enough to shift for themselves, by which time the young cocks, finding that they cannot in honour come within a few yards of each other without a battle, separate, each one taking a number of hens with him. These particulars I have gathered from native informants; but I can add, from my own experience, that either the season of incubation is uncertain, or that the hens lay in the cold weather with no more ulterior views than the domestic birds, for both in February and in March I have heard them emit that peculiar cackle, 'Tuktuk-tuk-takauk'; by which, everyone knows, a hen in a farmyard proclaims to the good housewife a fresh acquisition to her larder.

The flesh of the Jungle fowl, under favourable circumstances, is the most delicious of all game, but that of the old cock is beyond human powers of mastication. A young bird hung till moderately high can hardly be distinguished in flavour from the pheasant. The pugnacity of the male is as great in its wild state as in domestication, and affords ready facilities for its death or capture. The Burmese and Talaings pin down a tame cock or tether him by the leg in some spot frequented by wild poultry, when his cries soon attract a knight errant of the tribe, either within range of a gun, or the grasp of snares thickly set around the decoy.

As may be supposed, the Burmese and Arakanese, gamblers from childhood, are well versed in the mysteries of cock fighting. They do not clip the birds, as the promoters and followers of this amusement in England do, but give them the full benefit of their plumes, and arm them usually with but one 'steel', a tremendous weapon, in the shape and size like a large penknife, and which generally proves fatal in a very few rounds. The great mass of poultry in Burma and Arakan is of the Game breed, descended from Gallus ferrugineus, but having acquired in process of time, yellow legs and great increase of size.

Though the voice of the Jungle fowl has no pretensions to melody, it possesses great variety of intonation and expression. The crow of the male is too well known to require description. The cry is a challenge to combat, doubtless, but at the same time is regularly periodical, the inclination to 'crow' coming upon the bird apparently every three hours - that is at the commencement of every fresh watch, a division of time descended from remotest antiquity. When the cock has discovered some food, which he considers might be acceptable to the members of his harem, he calls them to the spot with a deep, soft clucking, similar to that which the hen employs to feed her young, picks up and lays down the morsels before them, and while they are greedily feeding, struts about with great pride and an utter disregard of his own gastronomic requirements. Indeed, were it not for a mouthful now and then taken on the sly, it is difficult to conceive how the cock manages to sustain his portly body. On rare occasions, intense hunger seems to overcome the poor fellow's sense of his devoirs to the fair sex, of furtively swallowing a choice bit, or bolting it in the face of Dame Partlet, to her astonishment, just as she had been invited to partake of it herself. When danger threatens, especially in the shape of a hawk or kite in the air, the cock utters a long, low croak, an unmistakeable warning to 'look out', on which the whole community of hens and young birds scamper under cover, while the chief remains ready to fight all comers. These birds roost always on some eminence in a wild state, on trees in the jungle; and before all the party has settled to sleep. the male occasionally gives a low, prolonged cooing whistle, to which a hen or two sometimes respond. As morning dawns they leap silently to the ground, and remain feeding about, and at or near six o'clock the cock mounts some elevation, and begins to crow at intervals for a quarter of an hour or so, after clapping his wings together two or three times back to back.

"This bird must be sought in all jungly country which is partly cultivated; and where paddy fields extend in long strips into the forest, the sportsmen walking one on each side just within the cover, with a line of beaters between them, can enjoy very pretty shooting. The fowls rise from the stubble and fly into the wood, passing overhead, and the sport resembles pheasant shooting in England, the flight and size of the birds being pretty similar. When the fields have been cleared of the fowls, the shooting may be continued with success in the woods if they be pretty open, and the sportsman furnished with spaniels, which cause the birds to tree, from whence very pretty snap shots may be obtained, as they will often rest on a high branch till the sportsman has arrived underneath before taking wing again. Both cocks and hens make desperate cackling and flutter when thus roused up by dogs, and I know of no shooting which requires greater nerve and steadiness. If there are no dogs, the birds will not tree, but run slyly and silently along, and are seen no more, unless you be mounted on an elephant, when it is easy enough to pot them, should you be so minded, as they skulk under the brushwood. The wild poultry are not subject to migrations, even to the extent to which pea fowl shift their quarters; but in the hot season and the rains they retire deeper into the woods, the cultivated tracts no longer affording food, while the sylvan recesses provide seclusion and shelter for breeding.

It may be asked, What are the processes by which all our various breeds have been derived from this one species? The explanation is not difficult. All animals, even those in a wild state, are subject to variation; differently coloured and formed individuals of every species are occasionally observed. These variations occur much more frequently amongst animals in a state of domestication; and mankind, from the remotest ages, have observed that such changes are hereditary; hence, when any variety has been noticed which it has been thought desirable to perpetuate, the progeny have been preserved. This process of artificial selection has been carried on for generation after generation: where great size has been required, the largest specimens have been selected for brood stock, and our Cochins and Brahmas have been the result. On the other hand, when smallness of size has been aimed at, the least specimens have been selected, and our bantam breeds have been thus produced.

Colour, form and even character have been varied in the same manner. Among the old cock fighters, a game cock that would not fight was killed and eaten, and the race was perpetuated by those birds having the highest strength, agility and courage. In the same manner variations of habit were rendered permanent. Eggs were required in larger numbers than chickens, and our non sitting varieties were the result of the care shown in the selection of breeding stock from those fowls that were the best layers and showed the least inclination to sit.

The varieties that were produced with so much care, require the same attention for their continual perpetuation; without it, all our valuable domestic animals would degenerate into a comparatively worthless collection of mongrels, destitute of the good qualities that distinguished so many of those varieties that are now characterizes as pure breeds.

The Gallus stanleyi, which is only found in the island of Ceylon, is the nearest ally to the Bankiva; it is distinguished, however, by its having a yellow comb with red edges and its reddish breast. Sir Emerson Tennent, writing of this bird, says: "It has never yet bred or survived long in captivity, and no living specimens have been successfully transmitted to Europe. It abounds in all parts of the island, but chiefly in the lower ranges of mountains; and one of the vivid memorials which are associated with our journeys through the hills is its clear cry, which sounds like a person calling 'George Joyce'. At early morning it rises amidst mist and dew, giving life to the scenery that has scarcely yet been touched by the sunlight." and Mr. Layard writes: "The Jungle fowl is abundant in all the uncultivated portions of Ceylon, but particularly so in the northern and north western provinces. It comes out to feed, morning and evening, upon the roads, cultivated lands, or other open places. The cocks are generally seen alone, seldom in company with their hens, who, however, are always in the neighbourhood, and keep together, even though their broods be of different ages. The cocks fight most desperately, the combat frequently terminating in the death of one engaged parties. As they not infrequently mingle with the fowls of the lonely villages, they cross with the domestic breed, being more than a match in courage for the plebeian dunghill cocks, and armed with tremendously sharp spurs. The hen selects a decaying stump or thick bush for a resting place, and lays from six to twelve eggs of a fine rich cream colour, finely mottled with reddish brown speaks. The young when hatched, resemble young chickens; and the old mother leads them to decaying prostrate trees, and scratches for white ants, which they eagerly devour. They are hatched in June. In wet weather Jungle fowl keep much to thick trees, sitting disconsolately, with drooping head and tail, among the branches also roost in trees at night, returning to rest early. It is rarely that a bird can be flushed; but when they do fly, it is very in the manner of the Pheasant; they run with incredible swiftness, and trust to their powers in this respect for safety. Their cry is a short crow, which resembles the words 'George Joyce', sharply repeated. I have frequently seen three or four broods mingled together with but one cock among them, who keeps his seraglio very much to himself, often, I understand, defending his ladies at the expense of his life. He is generally victorious when the tame cock is the aggressor; for his spurs are fearfully sharp."

The Sonnerat Jungle fowl, Gallus sonnerati, which is found in the south of India only, is remarkably distinguished by the flattened shafts of the hackle feathers of the cock, which have been aptly compared to spots of yellow sealing wax, a peculiarity which is leas strongly shown in the wing coverts and saddle feathers.

The late Dr. Jerdon wrote: "Like the Bankiva (Gallus ferrugineus), it is particularly partial to bamboo jungles. Early in the morning, throughout the Malabar coast, the Wywaad, etc., Jungle fowl may always be found feeding on the roads; and with dogs, you are certain of getting several shots on the roadside, the birds perching at once on being put up by the dogs. In some districts, where they can be beaten out of the woods, and especially on the Neilgherries, very pretty shooting is to be had at this Jungle cock, the sharply defined woods (or shoals, as they are called) being well adapted to being beaten for game. The hen lays from February to May, generally having from seven to ten eggs of a pinky cream colour, under a bamboo clump. The call of the cock is very peculiar. being a broken and imperfect kind of crow, quite unlike that of the Red Jungle cock, and impossible to describe. When taken from the jungles, they are more wild and not so easily domesticated as the Red Jungle fowl; but they have bred in
confinement with hens of the common breed. I have already noticed the occurrence, in a wild state, of hybrids between this and the Red Jungle fowl."

These hybrids, I may remark, have been abundantly produced in the gardens of the Zoological Society, where the breeds were allowed to roam freely over their ground. Mr. Douglas possessed a Sonnerat cock which he crossed with game Bantams, and then allowed the young to interbreed with the Bantam stock until all trace of the Sonnerat cross disappeared. This experiment was also performed when the breeds had a free range in the woods surrounding the Avaries of Clumber.

The last known species is the Fork tailed Jungle cock, Gallus varius or furcatus, which inhabits Java and some of the islands of the Malayan Archipelago. It is remarkably distinguished from the other three species by its single wattle; which, like its comb, is greenish red and yellow; the comb also is smooth at the edge, being perfectly free from serrations. The neck hackles are broad and rounded at the tip, and of a splendid metallic green colour; the saddle feathers bright orange with a dark centre, and the two central tail feathers are curved outwardly, hence the name of furcatus which has been given to the species. Hybrids between this species and domestic fowls have been produced, and the so called Gallus aeneus and Gallus temmincki have probably originated in this manner. These four species include all the wild Galli, the Great Kulm cock of India, the St. Jago fowl, etc. etc., which have been erroneously described as wild races, being, in fact, only domesticate breeds, that, like the Sebright Bantam, the Brahma, etc. are the result of long continued and careful selection at the hand of man."

Tegetmeier is very dogmatic with statements that the Domestic emanated from only the Red Jungle fowl. He was not prepared to consider anyone else's views or thoughts on the matter, nor would he give any ground. Frankly, I feel his argument has little depth for it relies only on variation. I think that most of us agree that variation plays an important part when considering the different varieties of fowls. However I find it hard to believe that variation alone is responsible for all varieties.

Tegetmeier, being a disciple of Darwin, probably contributed to this view. On the other hand if this was the case he should also agree with Darwin on the Origin of Species. However, Tegetmeier, or for that matter anyone that I can see have tendered evidence as from whence Gallus bankiva evolved. It just "growed, like Topsy".

Bankiva is apparently today, wild in the jungles as it always has been according to the text of Tegetmeier. I feel that if this argument is to stand up evidence as to the evolutionary process of Bankiva must be provided. Whilst I do not wish to discredit Darwin, which I have previously stated, Tegetmeier's outburst does not convince me. It is too biased. It is necessary to consider all the theories or whatever before we can consider the answer settled.

Tegetmeier didn't have the answer well over 100 years ago, and we still don't have it today. We must still keep searching, hoping some positive evidence will turn up. So in all fairness to Wingfield and Johnson whom Tegetmeier discredited I am tendering their thoughts on the subject from "The Poultry Book" by Wingfield and Johnson (MDCCCLIII) - Chapter XXIII - "The Wild Fowls of India".

"The list of our domesticated fowls has now been gone through, including, indeed, some of those sub varieties which we would rather refer to the intermixture of other breeds than dignify by the designation of distinct families. A short reference, therefore, to those races of the wild Galli that have been commonly regarded as the forefathers of our poultryard, will complete this portion of our labours.

First, in point of size, no less than the remote period at which we find reference to this bird, comes the Gallus giganteus of Temminck, the "Kulmcock" and "St. Jago Fowl" of other naturalists. The character of this inhabitant of the islands of the Eastern Archipelago and parts of the adjacent continent would seem to be far more suited to a state of domestication than we have reason to believe has been the case with others of the "Jungle Fowl", properly so called. It appears to have been reclaimed at the earliest period to which our knowledge of its native country extends, and in Europe, under the name of the "Malay Fowl" it shares the honours of a long pedigree with our oldest races. We have never seen a specimen of the wild bird, but all accounts unite in describing it as closely resembling the brilliant combination of chestnut, maroon, black, and yellow, that decorate the well known Malay.

This noble bird frequently occurs more than two feet in height, and Lieutenant-Colonel Sykes had one, described at page 169, which was twenty six inches. The comb of the cock is single, but slightly elevated, rounded at the top, and appears to terminate abruptly; the wattles are small, and the throat bare, as in the Guinea Fowl. Plumage of the hackle, head, and upper part of back golden-reddish; of the

mid back and lesser wing coverts dark chestnut; of rump reddish-yellow. Tail very full, and, like the large wing coverts, is a dark brilliant green; breast and belly glossy greenish-black; legs yellow. There is reason for believing that this bird is not only the parent of our Malay variety, but also of the Shakebag.

We have in another place ascribed the parentage of some dubious races, especially the Columbian, Brazilian, and Siberian fowls, to an intermixture of this Malay blood; but we must strongly express our dissent when, as sometimes happens, the Shanghaes are referred to the same origin. Whatever, indeed, may be the parentage of the latter, pure bred representatives of the family have nothing in form, colour, or character that would suggest any such relationship.

The birds commonly spoken of as Jungle Fowl consist of two distinct species, inhabiting different localities; the Bengal Jungle Fowl found in the northern portion of Hindustan, and as far north as the sub Himalayan range, and the Sonnerat Jungle Fowl, which seems to be limited to the more southern portion of the great Indian peninsula. A variety of Sonnerat's fowl has also received the appellation of Gallus stanleyi.

The Bengal Jungle Fowl resembles in the general colour of his plumage the Black breasted Red Game cock, while in size he is intermediate between that fowl and the Bantam. The tail in this, as, we believe, in nearly all the wild Galli, is carried horizontally, a peculiarity which is only effaced by inter breeding for several generations with the vertical tailed domestic fowl. It is also distinguished from all the other wild species by having a white face or cheek lappet, like our Spanish fowls.

Sonnerat's Jungle cock is distinguished by the singular flattening out of the shaft or mid rib of the hackle and saddle feathers; a laminated appearance is thus obtained of extreme richness, these plates being of a bright golden yellow. In our chapter on Game Fowls, we alluded to a cross between this bird and a Game hen, the produce of which was in the possession of Dr. Horner, of Hull. The kindness of that gentleman has since supplied us with some further information, which has such immediate reference to the subject of our present enquiries - the connexion between the wild and domesticated galli - that we now gladly lay it before our readers: "My Sonnerat Cock, as I have learnt from Mr. Hunt, chief superintendent of the aviaries at the Zoological Gardens, Regent's Park, was bred at those gardens, between the true Sonnerat Jungle Fowl and a Game hen. In size he is decidedly less than the Game cock, weighing but 3 lbs., and differing both in gait and carriage, as well as in shape, from all other poultry. He is remarkably quick, showing great activity and alertness in all his movements. In his ordinary walk he is not so upright as the Game, indeed, he has often somewhat of a stooping manner; his wings are drooping or carried low, which gives his back a rather rounded appearance, and showing off to advantage its rich plumage; the tail, also, is not carried so high as in other fowls. When at all excited, his gait and attitudes are light, graceful, and peculiarly alert.

The eye is particularly bright, sharp, and watchful; the wattles, and the comb, which is serrated, are of moderate size; the whole side of the head is red and smooth. The feathers, of the golden coloured hackles, of the neck, the larger of which are round or blunt at the end, and the fine, rich, dark, crimson feathers of the shoulders or saddles, have their shafts, or mid-ribs dilated, in one or two parts, into horny like plates, as seen on the wing of the Waxen or Bohemian Chatterer, and which are of an exceedingly rich, deep golden yellow; giving to the plumage a very refulgent and sparkling appearance, especially when the sun shines thereon. The feathers of the breast and back are more pointed than in other poultry, and are of a fine greyish colour, lighter in the middle part, and fringed on the edges, some with greyish white, others with various shades of yellow. The tail is of a shining greenish black, the smaller feathers near its root being a rich refulgent purple green, and some of them are laced with yellow; the legs are of a red colour.

As in mankind we often see true courage united with a gentle and amiable disposition, so is it in my hybrid Sonnerat, and that in a most remarkable degree. He is not only of a truly courageous, but even of pugnacious disposition with other male poultry; but to hens, or whatever breed, even the Shanghae, he is kind and courteous, and to his own mate lavishly so. A hybrid Sonnerat hen is now 'in the straw', and his attentions are such that he passes much of his time closely by the side of the nest, as if by his frequent low note, to administer hope and encouragement in her long seclusion.

It is, however, in the extraordinary attentions to his chickens that his amiable and considerate conduct shine so peculiarly forth. Last year when his chickens were half grown, and had long been discarded by their mother, he might be observed daily offering them in his beak all the delicacies he could select from the general food: nay, on occasions of a slight shower, or in cold winds, he frequently might be found with a pair of huge chickens hiding under his wings, which, by their size, were nearly lifting him off his legs. At night, one or more would invariably so nestle; keeping his wings, apparently, in no very comfortable position.

The eggs laid by the hen (his own granddaughter through a game hen) are decidedly smaller than those of the game, and weigh less by rather more than a quarter of an ounce. The loss in size is, however, well compensated for by quality; they possess a richness and flavour unequalled, and which is at once recognised by everyone.

In recording the good qualities of the Hybrid Sonnerat, according to my own experience, I should state them to be the unequalled richness of the eggs, their abundance, and the great beauty of the cock bird; and, in this example at least, his amiability.

Mr. Hunt informs me, that he considers there are but two cock birds in England really bred direct from the Sonnerat Jungle Fowl, and which exhibit the peculiar golden plate on the fathers, the one at present in the Regent's Park Gardens, and my own. He also warns me of the difficulty of rearing chickens bred "in and in", I have accordingly added a game hen as a companion. Though the old birds exhibit a certain degree of wildness in their look, yet a cockerel, raised last year, will daily take his food from my fingers, and his look is docile.

My hybrid hen is less than the common game hen, and is of more delicate. She exhibits much of the colour of the Duckwing variety, probably from her game parentage. The neck and breast are of a very pale ochre, the legs a light grey.

Author's note: This would substantiate the comments by Hutt (1949) that Gallus sonnerati carries the genes for silver Gallus bankiva, the genes for gold. This was referred to earlier

"Mr. Blyth, Curator of the Asiatic Society's Museum at Calcutta, states that he found the progeny between a Sonnerat cock and a domestic hen decidedly unfertile. He observes, that "the Sonnerat cock is peculiar to South India, from the Vindhyan Mountains southward. The very peculiar plumage of the cock, and every note uttered by either sex, totally separate it from every domestic breed. I have found it, however, easy to render very tame, and Gallus stanleyi also; both interbreeding with picked domestic fowls. A hybrid son of the Sonnerat was as salacious as his father, but unprolific; and so was a hybrid daughter - however, either were matched. This hybrid hen laid many eggs that were all unfertile, and so were all the eggs that should have been vitalizes by the hybrid cock".

In referent to the last paragraph of Dr. Horner's communication, we would observe that the gray plumage of the Gallus sonnerati is equally likely to have caused the hybrid hen's resemblance to the feather of a duckwing hen, as her maternal descent. It has indeed, often occurred to us that the theory of the Black-red-breasted Game Fowl's descent from the Bengal Jungle Fowl, and that of the Duckwing from Sonnerat's species is far from improbable.

Gallus furcatus, or the Fork Tailed Jungle Fowl, is another richly plumaged native of Java, but seems to possess no tie that might connect it with our domestic race. Omitting, therefore all further allusion either to this or Gallus aeneus, the Bronze Jungle Fowl, we pass on to Gallus bankiva, the most diminutive of its genus, and the stock to which our own Bantams are generally and with much probability assigned.

Depress the tail of a Black-breasted Red Bantam cock, and the distinction between him and Gallus bankiva would be very slight. You would recognize the same bare face and throat, the same ample serrated comb, the same golden hackle, and the same proportions of black and red on the remaining portions of the body. The hen has a corresponding resemblance to the female Bantam of the same variety.

The Gallus bankiva is a native of Java; but a bird nearly allied to this, though somewhat larger, is found on the continent of India. Writers, however, on the natural history of these countries, limit the designation Bankiva to the smaller fowl. In the former part of our work, an account has been given of an imported pair of Bankiva fowl, from which, however, no progeny was obtained, either pure or from Bantam hens that were introduced into their aviary; they retained this unsociable demeanour to the last; and after slaughtering several Bantams that had been thus placed with them, they themselves fell victims to the superior strength of a game hen. That many of our present breeds of fowls may have been derived from these four species, Gallus giganteus, Gallus sonnerati, Gallus furcatus, and Gallus bankiva, we have little doubt; but still these are not necessarily to be regarded as the sole ancestors. The Frizzled and Rumpless fowls, for instance, are both said to exist in a wild state; and the former especially is thus spoken of as inhabiting the interior of Ceylon. Their origin cannot be referred to a mere lusus naturae, and can hardly be assigned to any of the birds before mentioned. Should these, therefore, be thus distinct, why should a separate origin be refused to other races?

In our experiments at the present day, when we attempt either the domestication of the wild Galli, or cross them with the occupants of our poultry yards, we find few instances where their untamed character is so far subdued as has happened with Dr. Horner's Sonnerat hybrid. In by far the majority of cases, not only in this country, but even in India, there appears so decided a repugnance of the reclaimed state, that, if these were indeed the sole source from which the domestic fowl has been obtained, we are led to inquire by what process that, to us most difficult feat, was ever accomplished. In two ways may this have been effected; the first of which would rest on the supposition, that in times immediately succeeding the earliest records of our race, the birds that we now call Jungle Fowls were less indisposed to minister to the wants of mankind in a state of domestication or else one of their family, now no longer existing in a wild state, became at once the willing companion of man, and subservient to his will. A similar theory has been employed with reference to the camel, of which no naturalist has yet discovered any trace of an unreclaimed state, and some other members also of the animal kingdom seem to have at least approached the same condition of existence.

No positive conclusions, it is true can be based on such a line of reasoning; but it surely presents a path with fewer obstacles to our enquiries than the idea that the present economy of any portion of the animal kingdom varied so greatly at any time from what we now see to be its regular course, as an adherence to the notion that the natural habits of any beast of the field, or fowl of the air, underwent so violent a change, must necessarily apply.

The recent impetus that has been given to the study of poultry may throw fresh light on this intricate subject, especially by introductions from their native abode of the species of wild Galli to which we have alluded, or others that may still remain undiscovered in unexplored wilds, as yet untraversed by the foot of civilized man.

In Europe, we see comparatively little to recall the form, and still less that repeats the habits of the Jungle Fowls; and the following passage quoted in the "Quarterly Review" of March 1851, from the pen of Mr. Blyth, the Curator to the Museum of the Asiatic Society at Calcutta, points distinctly to the same state of things in India, where certainly we should most expect to witness at least some signs, or tokens, of transition from the jungle to the yard. It is remarkable that the domestic poultry of India do not approximate to the wild race in any respect more closely than the common fowls of Europe; and I have sought in vain for traces of intermixture of Jungle Fowl blood in districts where the species abounds in a state of nature."

THE ONAGADORI LONG TAILED FOWL OF JAPAN

Frank X. Ogasawara of the University of California at Davis some years ago wrote an article on the Onagadori variety in the National Geographic magazine. It is claimed that these long tailed fowls were developed some 300 years ago from the domestic fowl so therefore would not be considered as a separate species. Perhaps at a later date when dealing with the History of the Domestic Fowl I will go into more detail of this variety.

The males carry tails of around 25 feet in length and the breakdown of the name Onagadori is as follows: "O" for tail, "naga" meaning long and "dori" for fowl. Mr. Ogasawara, an avian physiologist took eggs back to the United States for research on this particular long tailed trait.

10TH CENTURY ARTIFACTS

The extensive private art collection of Mr. William Bowmore OBE of Newcastle, NSW, contains some artifacts which I viewed. in 1985 and I am of the opinion these artifacts are relevant to the subject under discussion.

The most interesting artifacts to me were two Persian Ceramic plates or dishes dated 10th century AD which were approximately 12 to 14 inches in diameter. One of these plates depicts a fowl which is so close in outline to the Standard type of a Modern British Game as we know it that it leaves no doubt in my mind that fowl of the Modern Game type must have been present in that area during the 10th century.

The tail depicted is fine, with a downward carriage as in the Malay. There is no resemblance to the Bankiva type. The whole outline is quite clear and distinct, the artifact itself being in first class condition.

So to is the condition of the other plate, although the figure depicted in this case is smaller and of a different type of bird. Not at all like the Modern Game, the body more of the Bankiva type, yet when it comes to the head and neck could perhaps resemble a pigeon. This figure does appear to be carrying spurs and the tail consists of two feathers with a space between them.

From these two artifacts it would be reasonable to assume that at least two distinct types of fowl were present in Persia during the 10th century AD.

Mr. Bowmore also has three 5th century Incised Plates from a Sea Excavation in the Mediterranean area depicting birds. One of these plates shows a bird which very closely resembles the now extinct Dodo from Madagascar.

These ceramics from Persia I feel are very significant and strengthens the argument that the Malay or Gallus giganteus may have been involved as a progenitor of our Domestic fowl as well as Gallus Bankiva, Gallus sonnerati etc..

SEROBIOLOGICAL RELATIONSHIP BETWEEN JUNGLE FOWL AND DOMESTIC FOWL

Summary of a section paper from the Twelfth World's Poultry Congress, Sydney, Australia, 1962, written by Kiyotsuna Sasaki and Hozo Suzuki, Japan.

"To clarify blood relationships among the Red Jungle fowl, Domestic fowl (Japanese native fowl and White Leghorns) and their hybrid serological (precipitin test) and electrophoretic examinations were carried out. The results obtained are summarised as follows.

From the results of absorption tests on anti-Jungle fowl, anti-Japanese native fowl and anti-White Leghorn and anti-hybrids sera which had been produced by injecting rabbits with the corresponding sera, it was recognised that common antigens were present in Jungle Fowl. Domestic fowl and their hybridis sera and that no species-specific antigens were present in Jungle fowl and Domestic fowl sera. Any new specific antigen which was present neither in Jungle fowl serum nor the Domestic fowl serum could not be recognised in their hybrid serum.

When Jungle fowl, Japanese native fowl and their hybrid sera were treated with barbitone buffer (pH 8.6) or barbitone buffer (pH 9.0) containing 20% methanol, in paper electrophoretic tests, no differences could be recognised among the mobilities of the serum protein fractions of the sera. The relatives ratios of albumen, $\alpha 1$ -, $\alpha 2$ - and β -globulin were higher than that of γ -globulin was lower in Jungle fowl serum than in Japanese native fowl serum. The hybrid was between, its parented sear with regard to the relative ratios of these fractions."

I'm afraid the foregoing is above my head, but I feel it is perhaps relevant to the subject being discussed. Some of my readers may be able to pinpoint any relevance. I hope so.

THE

NATURAL HISTORY ^{or} GALLINACEOUS BIRDS.

VOL. I.

ILLUSTRATED BY THIRTY-TWO PLATES, COLOURED.

BY

SIR WILLIAM JARDINE, BART. F. R. S. E., F. L. S., &c. &c.

WITH MEMOIR OF ARISTOTLE BY

ANDREW CRICHTON,

Author of " The History of Arabia," &c. &c.

EDINBURGH:

W. H. LIZARS, AND STIRLING AND KENNEY;

LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN, LONDON;

AND W. CURRY JUN. AND CO. DUBLIN.

1834. mary THE

NATURALIST'S LIBRARY.

ORNITHOLOGY.

YOL.III.



Gallus Bankiva

EDINBURGH, WH LIZARS. & STIRLING & KENNEY LONDON LONGMAN & C? DUBLIN. W.CURRY JUNF & C?



GALLUS GENEUS.

dears se.



Luzars Sc.



Luzar: Se.







