THE ORIGIN EVOLUTION

HISTORY

AND

DISTRIBUTION

OF THE

DOMESTIC FOWL

PART 2

CHICKEN BONE RECOVERIES

SUPPLEMENT

W. J. PLANT

1985

~SUPPLEMENT~

TO

"CHICKEN BONE RECOVERIES"

PART 2

W. J. PLANT

(1984)

26/7/84

With Compliments
William J. Plant
12/9/94

1985

David J PLANT
46 Newcastle Road EAST MAITLAND
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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.

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Yours Sincerely

DAVID PLANT

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BY ELIO CORTI

VALENZA - ITALY - FEBRUARY 3RD, 2010

THE SUPPLEMENT

When I published CHICKEN BONE RECOVERIES in 1984 I was aware at the time that at a later date it would be necessary to add further information to that which I had published. I was confident that this material would come to hand and my hopes were realised.

A number of copies of my publication were circulated and feedback received from them. I also pursued other contacts which again yielded I feel most important information on the subject. I do believe that there will still be more material come to hand for at the time of writing (1985) Professor Higham of the University of Otago in New Zealand is working again in Thailand, and information I received from Dr. Jim Specht of the Australian Museum in Sydney advises that Dr. Roger Green of the University of Auckland, New Zealand, has been working at Watom Island, New Britain.

The North China discoveries of Professor Zhou Ben Xiong are in my opinion most important. His findings will need some re-assessment of earlier material. Mrs. Rodwell's analysis of his work supports this. On the other side of the world the work of Professor Harrison of the British Museum (Department of Ornithology) in identifying a new fossil species of Gallus i.e. Gallus europaeus throws new light on the situation in the Western world. This I feel is most important. I have included material from Zeuner (1933) which I did not have available previously. However it is still relevant to the overall study.

A little more information on the Araucana of which I spoke of (1984). However this does little to support my hypothesis as to their origins.

Also included are comments from Mrs. Banning Vogelpoel of The Netherlands and Professor George Francis Carter of the Texas A&M University, College Station, Texas, both long time correspondents of mine who have interests in what I have been doing. Their assistance is most appreciated as is the assistance of Patricia Vickers-Rich of the Monash University in Melbourne who provided me with the means of making contact with Dr. Han Defen of the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing, China. Dr. Han Defen was instrumental in obtaining for me a copy of Professor Zhou Ben Xiong's paper and also photographs which appear with this text.

To Dr. P. Wong and Dr. K. Y. Chan of Sydney and Dr. L. Kwa of Maitland, N.S.W. I am indebted for their assistance with translations. Professor Harrison of the British Museum very kindly provided me with a copy of his paper on the new species.

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FURTHER INFORMATION FROM CARTER AND BANNING VOGELPOEL

Since publishing Book 2 of the series ORIGIN, EVOLUTION, HISTORY AND DISTRIBUTION OF THE DOMESTIC FOWL, further information has come to hand on that particular subject. I had hoped this would happen as my intention was to publish the information I had collected, so that it could be added to, for I felt there was much more to be learnt and it would appear my thoughts in this direction were correct.

As time goes on and I hopefully publish further books on the overall subject, I hope this feedback of information will continue to come forth -- anything of this nature will be added as a supplement in each succeeding publication.

First of all I would like to correct an error in Book 2 - Chicken Bone Recoveries - Page 13. The location of Picuris Pueblo referred to is NOT in Mexico but is one of the northernmost Pueblos in the state of New Mexico in the United States. This information came from Professor George F. Carter of the Texas A&M University, who also stated, and I quote from him: "The people of Picuris clearly had chicken before the time that they moved onto their new site - the present Picuris Pueblo" ... "The

chicken bones present at Picuris at 1400 AD, it seems to me, clearly proves the case for the pre Columbian presence of chickens in America. When you add the linguistic evidence, religious usages etc., the conclusion of multiple introductions before 1500 seems indicated. We would have more evidence, I think, if the idea of the post 1500 introduction of the chicken were not so strongly held. I hope that your work spurs the kind of attention to the chicken bones that they deserve".

Professor Carter goes on to say: "I have recently reviewed Paul Shao's work on comparing Chinese and American art – with asides on Indonesia, Malaya and India. The evidence is overwhelming - beginning at least as early as Shang and Chou times, the Chinese were colonising America - coming by sea. If I used the same line of reasoning that you do for the Dutch (opportunity equals introduction) then Mexico, Central America and South America should have Asiatic chickens from at least 1500 BC onwards. It seems highly probable that chicken bones have frequently been recovered in American archaeology. Many have been discarded as 'intrusive', others simply thrown away. Others simply never identified. My hope is that your work will lead to more attention being paid to these invaluable bits of evidence. I will not argue the Dutch case with you. It is purely speculative that they brought chickens. They may well have but there is seemingly no evidence that they did. That chickens of the appropriate type are present, is no proof at all given the clear evidence of Asiatic contact with America in pre Columbian times. The Malay naked necks are not limited to Chile, or its environs, but they are widespread - clear up into Mexico. The Finsterbusch quote is clear off the mark. The fowls that he enumerates are not limited to the area that the Dutch pirates occupied but are found clear up into Mexico. His facts are faulty, an so his reasoning incorrect. ... On the Dutch and their carriage of chickens, I still think that as a possible, but not a probable. The Malay naked neck chicken with its enormous bones, is found all over South, Central America and Mexico. It does not seem a likely distribution resulting from a Dutch introduction in Southern Chile."

The proceeding quotations were taken from a personal communication from Professor George F. Carter dated the 14th October, 1984.

From Mrs. A.C. Banning Vogelpoel of the Netherlands comes the following interesting information in a personal communication of the 20th March, 1985: "I remembered an article on the Araucana in the National Geographic Magazine of September 1948 written by F.G. Vosburgh under the name of EASTER EGG CHICKENS. The author wrote it because he was fascinated by an earlier large article in the National Geographic Magazine of April 1927 - THE RACES OF DOMESTIC FOWL - 30 pages by M.A. Jull with 67 illustrations and 29 paintings from life by Hashime Murayama. One of the paintings shows 3 Araucanas, rumpless with ear tufts, laying blue eggs. The 1948 Vosburgh article is written about research on the breed by Dr. Alexander Wetmore, Secretary of the Smithsonian Institution and Vice-Chairman of the National Geographic Society's Research Committee and I quote from Vosburgh: 'The origin of the blue egg laying characteristics is unknown. One story is that chickens which landed from a wrecked vessel crossed with the tinamou, a small South American member of the ostrich tribe, which is virtually tailless and lays coloured eggs. However, Dr. Wetmore, a distinguished ornithologist told me that he believed, this would be biologically impossible. He is convinced that the Araucana, like all other American breeds, is derived from chickens imported to the New World from the Old'.," end of quote.

From Mrs. Banning again: "One of these days I read THE CHICKEN BOOK written by Page Smith (historian) and Charles Daniel (biologist) in 1975. The story these Americans wrote on Araucanas is very interesting and I quote: 'We have already assigned the earliest chickens, at least tentatively, to India, the Chinese mainland, Southeast Asia and by diffusion over sea lanes, to the Pacific Islands. But by the time of the Spanish conquest of Mexico the Incas were thoroughly familiar with chickens and the name of the last Inca, Atahualpa, was the Quechua name for chicken. Thus evidence and common sense are strongly on the side of the "pre Columbian chicken". The only question that remains (and one that probably can not be answered with any certainty) is whether the chicken was indigenous to America - that is to say whether birds closely related to the chicken were domesticated by tribes of the Americas or whether they had been brought across the ocean by Polynesian sailors or even, perhaps, by the Egyptians themselves. In support of the "indigenous chicken" it might be pointed out that grouse and chickens are so closely related as to be almost indistinguishable in their bone structure. Certainly the South American Araucanas have a decidedly grouselike appearance. In addition the Araucanas bear a striking resemblance to Asiatic breeds. The pure Araucanas are rumpless and melanoid (black in pigmentation). I suspect that chickens were in fact brought to the west coast of South America by

venturers whose voyages are unrecorded in any. historical annals. These birds may very well have mated with native grouse. What is most striking of all, and perhaps gives the strongest support to the theory of indigenous South American chickens, is the fact that the Araucanas are unique among breeds of chicken in the world for their green and blue' eggs. Moreover they take their name from the ruggedly independent Indians of the Chicken mountains, who remained remarkably free of Western influences until the end of the nineteenth century, when the first Araucana chickens were identified. Perhaps the last word can be left to José de Acosta, a Jesuit missionary who wrote in 1590: 'I must say I was astonished at the fowls which without doubt were kept there even before the coming of the Spaniards, this being clear by the fact that the natives have names of their own for them, calling a hen "gualpa" and an egg "ronto". A later visitor noted: 'In the first accounts we have of the conquest, we frequently hear of hens and the name leads us to believe that they were like our own; this, however is not so and only the birds of Paraguay and Tucuman were somewhat similar to ours' ". End of quote.

From Mrs. Banning again ... "You want me to comment on your theory on the Araucanas. It is a good theory but I also like the theory in THE CHICKEN BOOK: It is possible to cross a chicken and a common pheasant and have fertile descendants. So why not a grouse X chicken cross. It is rare and it is possible to get infertile birds, but there are crosses which proved to be fertile. In the old Dutch Standard, which I quoted earlier, the Araucanas are listed under wild fowl. This list covers G. Bankiva, G. Lafayettei, G. Sonnerati, G. Varius, G. Giganteus and Araucanas. I think consider Araucanas as an original wild breed, which is crossed with Asiatic and Spanish domesticated fowl is also a good theory. You know that the fauna on the different continents is not equal. In America, Africa and Australia, the development of the fauna is not equal to the development on Eurasia, each continent has its own fauna and therefore South American chickens can have developed in their own way and differ from other chickens".

In another personal communication from Mrs. Banning Vogelpoel of the 21st January 1985, she has this to day: "On page 9 of your book you quote from the letter of Professor G.F. Carter and he mentioned the Dutch book of R. Houwink DE HOENDERRASSEN or the "Breed of Fowl" as I translate the Dutch title. This book is well known here from libraries and collectors of old poultry books and the Dutch Poultry Association has a plan to re-edit the book, but the price will be very high, about 200 guilders, that is about 60 dollars now. Houwink was a shopkeeper in colonial produce, a grocer. He was a poultry fancier like you and me without an academic training on the subject of his book (4 parts). But he had read all the books about it. He admired Darwin and also Mendel, whose laws on heredity were re-discovered in the first years of the century. In his book (1909) he quoted all the older writers on poultry as Temminck (1817), Bechstein (1801), Aldrovandi (1600), Columella (4 – ca. 70 AD) and many others. For your study the part of the fossil bones is important. So Houwink quotes Professor L.H. Jeitteless (Zool. Garden 1873) ... New research has proven that in the tertiary period species of fowl existed in Europe. In the younger period (quaternary), the period of the Mammoth, there were two varieties of a Bankiva-like fowl contemporary of people. Fowl in the latter stone period became extinct and in the tertiary period was introduced again. Poultry has been spread in prehistorical time from Further India and China to Middle and East Asia. Poultry was known by the Celts and Teutons long before the Roman imperium was known and it came not to the Celts and the Teutons people via Italy, but direct from the Orient through North Russia, Poland and Hungary, with people when they Were invading Europe. ... Houwink also quoted Victor Hehn's book "Culture Plants and Domestic Animals in their coming from Asia" (1902) ... There is a close relation between the languages of all old people and the names of domestic poultry. The Teutons call the chicken "hana", all Teutonic tribes know this name. (In Dutch haan (cock), hen (hen), hoen (fowl)). Slavonians and Lithuanians have always lived apart from the Teutons, they give the chicken another name. ... Houwink writes that he visited the Museum of natural history at Leiden, and he found there a very large collection of the 4 well known wild jungle fowl, with their skeletons, also several very important crossings of the 4 jungle fowls and crossings of the jungle fowls with domestic fowl of Java. So he could compare skulls and legs of wild jungle fowl with crossings and tamed Bankivas and fossil skulls and legs, where are described by Professor L.H. Jeitteless.

He quotes: "Gallus of the tertiary period GALLUS BRAVARDI found by Bravard in volcanic tuff of Ardes near Issoire (France), Puy de Dôme (Pliocene period) piece of chicken leg. This Gallus variety stands in size between peacock and domestic fowl according to Gervais. It resembles much a leg of a tame fowl

Gervais, found earlier a piece of a leg at Cadillac, not the same as Gallus Bravardi.

GALLUS AESCULAPII, phasianus Archiaci - from the Miocene period of Pikermi near Athens (Greece). (Bull. Society Geolog. d. France 1862).

GALLUS FROM THE BELGIAN CAVES - Schmerling found in the caves in the surroundings of Luik (Liège) remains of domestic fowl, among bones of extinct animals: elephants, bears, hyenas etc. Size of a domestic chicken and a smaller one but same variety. GALLUS FROM THE BELGIAN CAVES SMALL VARIETY. A.M. Edwards found in the caves of Lherm (Ariège, France) among bones of bears, rhinoceros, foxes, a complete leg of a cock male, but a little shorter as a Bankiva male, but a little broader. The spur was weak, seems to have been long. The leg resembles much the one Schmerling found.

GALLUS OF THE YOUNG QUATERNARY PERIOD - Dr. P. Rutimeyer found in the pile-dwellings dated in the Bronze Age in Switzerland a leg of a cock male, at Morges at the lake Geneva. Dr. Rutimeyer believes that this fossil looks as from a younger age. Also were found chicken legs in the terramare and palafitte of Parmeci and in the Terramare of S. Ambrogio, places almost equal to the pile-dwellings (palafitte = pile-dwellings, terramare = bottom or soil of a lake).

This was Houwink about the fossils of chickens in Europe found before 1909. It proves that in Europe there lived poultry in the time between the ice ages and the climate must have been tropical in that time.

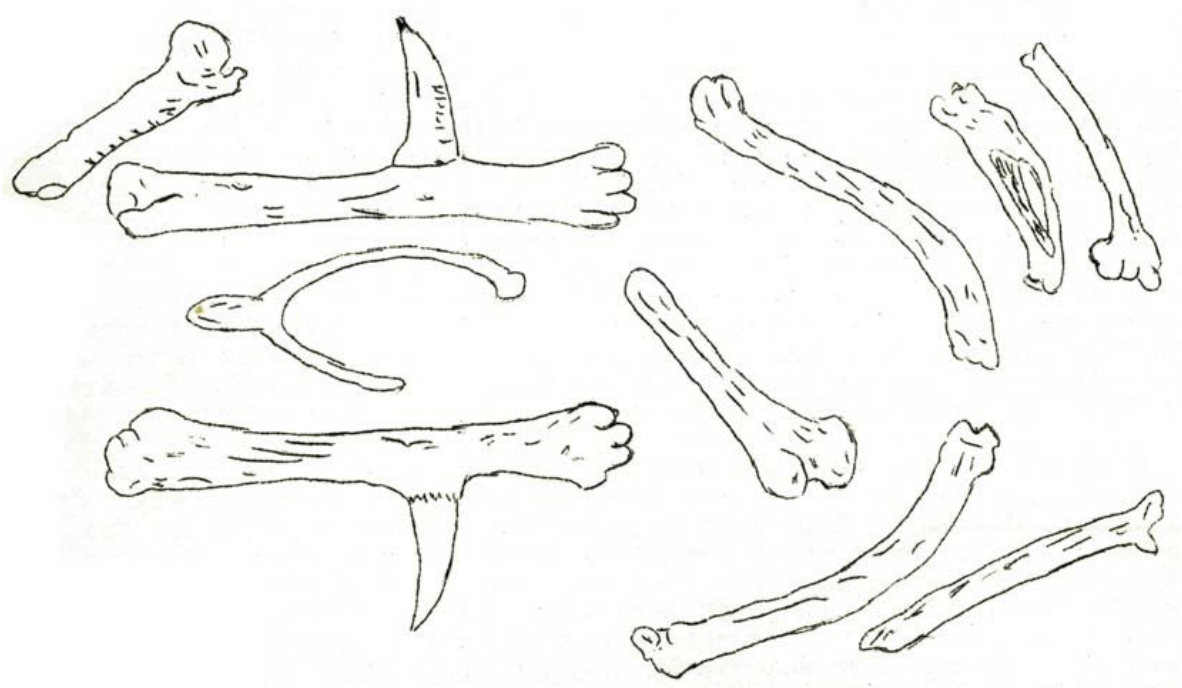
Comparing the skulls of wild jungle fowl with species of skulls Darwin describes in one of his books, Houwink concluded that the skull of the Bankiva of Darwin must have been a tamed Bankiva because it was larger than the skull of the wild jungle fowl. So far Houwink's book. It is worth questioning that the late Mr. C.S. Th. van Gink, the famous poultry illustrator, sketched a part of the illustrations in Houwink's book. Van Gink was a very young man when he did this, it was his start in this art, that he did his whole life and of course his later illustrations proved to be much better than his first work. Van Gink had a job at a bank at that time, but he resigned from the bank to be able to sketch full-time. He studied poultry science and was a well known fancier and a poultry and pigeon judge. He wrote several books and was editor and writer for poultry magazines. In the Dutch standard of 1960, he wrote about the oldest Dutch breeds of poultry.

The Drenthe fowl, being in the first years of this century almost extinct, are a part of the old European common fowl, being with Frisians, Groninger Mew, East Frisian Mew, Hamburger, Campine and Ardenner fowl. From their origin is little known, first it was supposed, these old European fowl were the descendants of the Bankiva jungle fowl, tamed in East Asia and via different routes come to N-W Europe. Later research gave motive for the development of a theory that the old-European fowl are the tamed descendants of in Europe living wild fowl, which are, in contrast to the Asiatic wild jungle fowl, totally extinct since long. Further one goes more and more to the opinion, that the domestic breeds of poultry don't descend exclusively from the Bankiva and probably are descended from more different breeds of wild fowl.

Crossings have proved, that the wild species are fertile among themselves. In form and stature as in type of feathering is little difference. Concerning colour and pencilling, there are certain resemblances and certain differences. So far the text in the Dutch Standard of Mr. Van Gink.

I think we owe the large knowledge of jungle fowl in the Netherlands to the fact that Indonesia was for centuries a part of the Dutch Kingdom. The jungle fowl were studied at Java by Dutch scientists and all the knowledge is stored in libraries and museums as in Leiden, the town with the oldest Dutch University." End of quote from Mrs. Banning.

My sincere thanks go to Mrs. Banning Vogelpoel for the information she has tendered. Over the years she has been most helpful in my researches, providing information in a subject in which she is extremely well versed. I might add, Mrs. Banning over the years, has co-operated with Mr. Frank L. Gary, Chairman of the Standards Committee of the American Bantam Association, providing him with much information when he was compiling standards of European bantams. Mrs. Banning is also the author of "Japanese Bantams", published in 1983 in English by the American Bantam Association.



Cock's bones found in a Roman urn at Lewes by Dr. Gideon Mantell in 1814
From "The Poultry Book", Johnson and Brown 1912.

Recent recoveries in China

Following in part is a paper prepared by Sally Rodwell of Cambridge, England, received by me in early 1985. This paper will be published in full in the 5th Volume of the I.P.P.A. Bulletin during 1985. I have selected from it text relevant to the chicken, the study of which I am concerned. The recoveries referred to in it I feel are of great importance as it would appear their dating precedes that of previous chicken bone recoveries, so perhaps some reassessment of previous writings will be required.

Unfortunately it appears that it is still not determined with certainty the species recovered apart from the fact that the metatarsals were compared with specimens of modern chickens in the Peking Natural History Museum and it was found those from the Cishan site in North China resembled those of the Red Jungle fowl. The paper is an analysis of the work of Professor Ben Xiong Zhou (1981). So from Mrs. Rodwell's paper which is entitled "China's earliest farmers the evidence from Cishan".

"Recent excavations in North China have produced evidence of farming communities in the sixth millennium BC. These people were hunter gathers as well as farmers and they preceded the Yang Shao farmers by a thousand years. Of particular interest is the Chinese archaeologists' claim that the chicken was domesticated at this time, some three thousand years before the domestication of the chicken at Mohenjo-Daro, in the Indus Valley. In the West, participants in the British Academy Project in the early history of agriculture have emphasised the gradual transition to agricultural societies in Europe in the post-glacial period, and the variety of ways in which man has exploited his environment, ranging from the most casual gathering of food to the most intensive methods of propagating plants and rearing livestock. Jarman, Bailey and Jarman (1982) have shown that many of these practices are overlapping and that often there is no dividing line between hunter-gatherer and farmer. Bailey (1981) prefers to classify the continuum of man/resource relationships".

Chronology

"The archaeological site at Cishan was excavated between 1976 and 1978 and was reported in March 1981 in 'Kaogu Xuebao'. It is the typesite for two recent excavations in Hebei Province. These sites date from the sixth millennium BC and have been named the Cishan culture by Chinese archaeologists. A second cluster of sites located south of the Yellow River in Central Henan has been named the Peiligang culture after its typesite and a third group of sites in the Weishui valley of Shaanxi has bean named the Laoguantai culture. All these sites date from the sixth millennium BC. As yet the only detailed reports to have been published are of Cishan and Peiligang, a burial site.

The discovery of these sites helps to fill a gap in the archaeological record in North China between terminal Pleistocene sites of Zhoukoudian, Sjara-osso-gol, Shiyu and Xiaonanhai, dated to before 18,000 years ago, and the farming communities of the Yangshao period of the fifth Millennium BC. Apart from Cishan, Peiligang and Laoguantai culture, reports are beginning to emerge of a pre-agricultural microlithic tradition in the Northern Plain. A solitary human skull found at Ziyang in Sichuan province has been dated to the sixth millennium BC at the earliest. The later transition to agricultural societies in southern and eastern China was based on rice rather than millet cultivation. The three radiocarbon dates from the earliest layers at Cishan (ZK 439, 440 and BK 78029) range from 5405 to 5110 BC calibrated to 6005-5794 BC and the three radiocarbon dates from Peiligang are 5935 + or - 480 BC (ZK 434), 5195 + or - 300 BC (ZK 571), calibrated to 5879 BC and 7350 +or - 1000 BC (ZK 572). There are Peiligang culture ranging from 5315-5025 BC calibrated to 5916-5737 BC (An 1980 : 37).

Remains of animals birds and riverine species

Of the animals, birds, fish and bivalves found at Cishan, Zhou considers dogs, pigs and chickens had been domesticated and their remains constituted 60% of the assemblage. He does not indicate how this figure was calculated, whether it was by weight or by numbers of bones. Wild boar were also present and some dog bones which were difficult to identify. There were no remains of sheep. The wild animals included: moles, hares, monkeys, badgers, masked civets, leopards, sika deer, red deer, David's deer, roe deer, water deer, muntjak, short-horn ox, wild boar, wolves, a single bean goose, turtles, carp and bivalves. The range of species present indicates a rich environment and the availability of riverine and forest resources. The quantity of each species is not reported.

Chickens

Zhou reports that a relatively large number of chicken bones was found at Cishan. These included clavicles, humeri, femurs, ulnas and radiuses as well as metatarsals. He compared the metatarsals with specimens of modern chickens in the Peking Natural History Museum and he found those from Cishan resembled those of the Red Jungle fowl, the chicken's wild ancestor. The Cishan metatarsal comprised thirteen bones with spurs, belonging to cocks and one without a spur which was thought to belong to a hen. The average length of the metatarsals was 79 mm and the hen's was 70 mm ---- (Author's Note: Referring to my 'Chicken Bone Recoveries' (1984), page 8, when discussing Stanley C. Ball's Jungle Fowls of the Pacific Islands his specimens were of Bankiva parentage. The average length of the tarsus of the 48 males collected by Ball was 79.3 mm).

Zhou then compared the Cishan metatarsals with those of various members of the pheasant family -- the common koklass, the golden pheasant, the brown eared pheasant, the Korean ring necked pheasant and the red jungle fowl, as well as the modern domestic chicken. He found that the Cishan specimens were larger than those of the modern red jungle fowl but smaller than modern domestic chickens and he concluded that although the Cishan fowl might have been wild they were probably early domesticated. It seems that the prehistoric birds grew larger with domestication rather than smaller. This-is the-reverse of the effects which archaeologists have observed in mammals but it is similar to the effects observed by Sewell and Guha in chickens at Mohenjo-Daro and quoted by Zhou. It should be noted that modern breeds of Chinese, the Langshan and the Cochin, are particularly large and heavy in bone (Jull 1938: 13-15). The standard weight of a Cochin cock is 11 lbs and that of Langshan is 9.5 lb.

Zhou supports his view that the chickens were domestic by postulating that the preponderance of cocks in the assemblage reflected either the use of cocks for ritual purposes or the slaughter of cocks for meat and the preservation of females for egg laying.

Zhou points out that chicken bones were found in quite large quantities at the Baoji site, Baoshouling (dated to the fifth millennium) and a few bones were found at Banpo covering the same time span. Earthenware models of chickens were found at the Qujialing site (dated to the third millennium and at Tianmen in Hubei.

Finds of bones from the Miaodigou 11 site have also been dated to the third millennium. It would appear that, as in the case of pigs, there is a continuity in the exploitation of chickens in North China.

In his report Zhou discusses the evidence for the earliest domestication of chicken in world, including the material from Mohenjo-Daro, Egypt and Western Asia, as well as literary evidence. The remains of chickens at Cishan predate those found at Mohenjo-Daro by more than three thousand years. Indeed

bones of red jungle fowl found at Xianrendong in Jiangxi province have been dated to the seventh millennium BC (Ho 1975 : 98) and the continuity of their appearance in faunal assemblages throughout the later Chinese Neolithic period implies early exploitation by man in this part of the world.

Again from Rodwell: The data on the chicken is of great interest since there has been little work undertaken in the West on the origins of the domestic fowl. These zoological and avian considerations apart, additional evidence for the controlled exploitation of pigs, dogs, chickens and millet at Cishan is the combination of a sedentary settlement, a favourable environment, large quantities of these remains and the continuity of the Cishan traits with the traits of sites of the later Yangshao period.

Mrs. Rodwell's paper I feel is of great importance in the study of the origins of the domestic fowl. It opens new avenues to these studies as well as the study into the origins of other domestic animals such as pigs, dogs and also plants. I would recommend that anyone interested in these fields of study should obtain a copy of this paper which they could study in full.

Further to the analysis by Mrs. Sally Rodwell of Professor Zhou Ben Xiong's work at Cishan I was fortunate to obtain in July 1985 a copy of Professor Zhou's paper with the assistance of Dr. Han Defen of the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing (Peking) China. The paper include a photograph of the chicken bone rec. at Cishan, which I have reproduced as well as the relevant text contained in the paper. I have also reproduced a map of part of China relating to the general area under discussion. The names of some of the sites mentioned are underscored e.g. Baoji and Wu'an. Some of the sites mentioned would perhaps be villages, of which there would be many in China and therefore not shown on the map.

I have marked the site of Xi'an (Sian) referred to in "Chicken Bone Recoveries", page 25 when discussing a communication from Professor Stanly J. Olsen, Department of Anthropology, University of Tucson, Arizona wherein he discussed the material recovered from the Neolithic site of Pan-p'o near Sian in North China. The map will also give the reader an insight as to the location of these sites with regard to Beijing.

Following is a translation of Professor Zhou's paper referring to the recoveries at Cishan, Northern China, which is located I believe at out 1000 km south west of Beijing (Peking) and about 1000 km east of Yen An. I am indebted to Dr. K.Y. Chan of Sydney NSW, Dr. Percy Wong of Springwood, NSW, and Dr. Wilson Kwa of Maitland, NSW, for their assistance with the translation of the following paper.

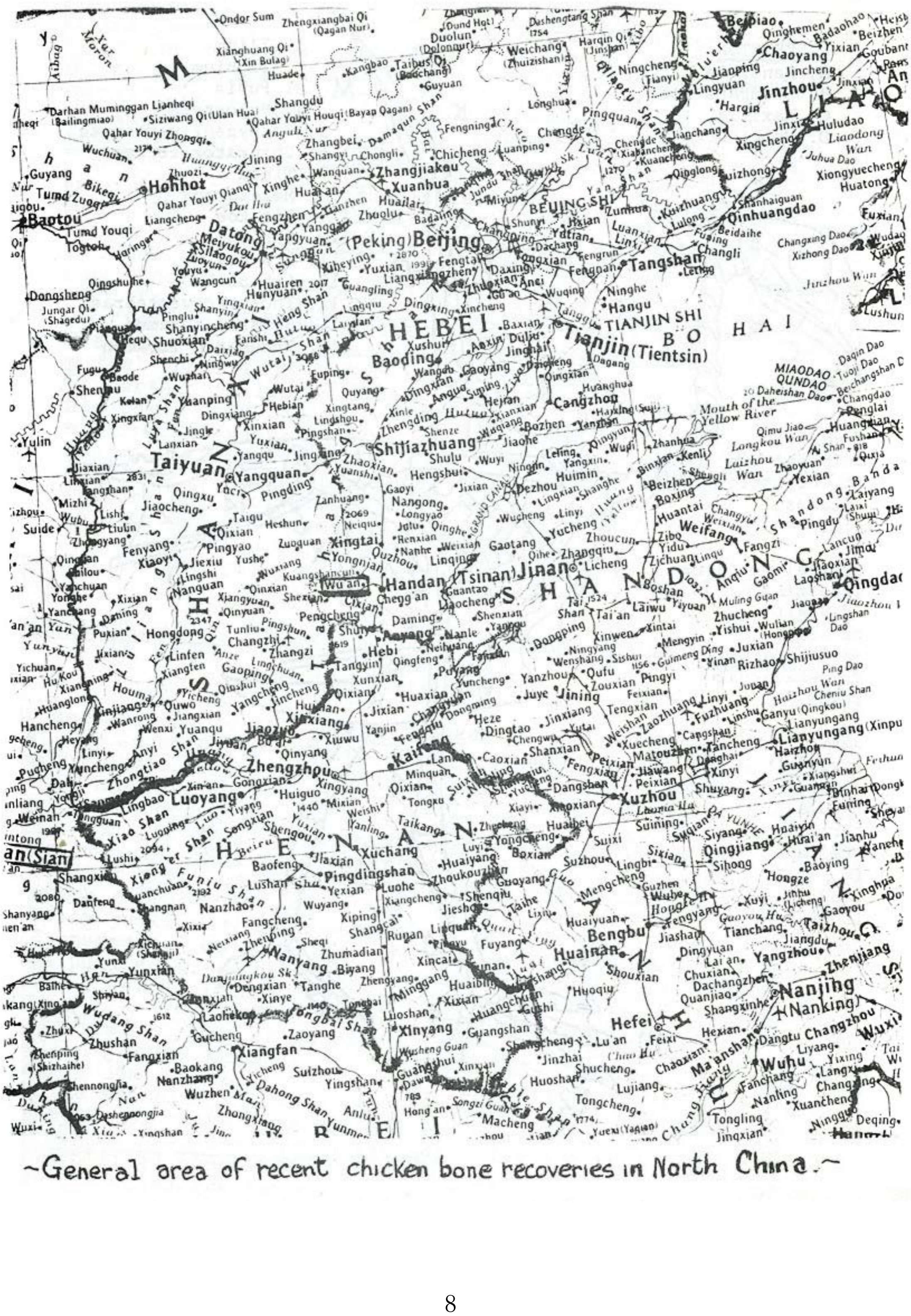
THE QUESTION OF THE ORIGIN OF THE DOMESTIC FOWL - Professor Zhou Ben Xiong - Quite a large amount of birds' bones were discovered in the relic of Cishan in Wu an of Hebei Province besides two pieces of bones from Anser fabalis L. the rest all belonged to Gallus gallus domesticus L. and are mainly tarsometatarsus bone. When we compared these specimens from Cishan with those of the modern bird specimens located in the National Museum of Beijing we found that they were similar in size and shape to those of Gallus gallus (L). Gallus gallus (L) belongs to Phasianidae and is a member of the family Phasianinae. A significant discovery from the specimens from Cishan is that, with the exception of one, all the metatarsus bones were those of male birds. Table 4 shows the dimension of the tarsometatarsus specimens from Cishan. Table 5 compares the latter with those of other members of Phasianinae family. From the table (Table 4) the 13 male metatarsi had a range of 72.0-86.5 mm and a mean of 79.0 mm, whereas the only female bone was 70.0 mm long. From Table 5 we can see the tarsometatarsus from Cishan fowl is larger than Gallus gallus but smaller than the modern fowl. Most researches believe the modern fowl originated from Gallus gallus (L). The latter are still found in Northern India and southern part of China, namely: Yunnan and southern part of Guangxi province, Hainan etc. Research carried out by Zheng Zou Xin (1978) suggests that there is archaeological data supporting that in ancient time Gallus gallus (L) were present as far north as Central part of China. So far, skeletons of fowls from the New Stone Age have been discovered in various parts of China, namely:

(1) 4 pieces of hones found in second stage of ?----? excavation 2789 BC (Author's note: Unfortunately the location name was not translated in this case. However, although I stand to be corrected from another part of the translation the bones were large and small tarsus, femur and wing bone)
(2) Ceramic fowl (believed to have been modelled on real domestic fowl at the time, 2695 BC)
(3) 7 pieces of fowl bones discovered in Xian province, 4290-4770 BC
(4) Shanxi province, BC 4515.

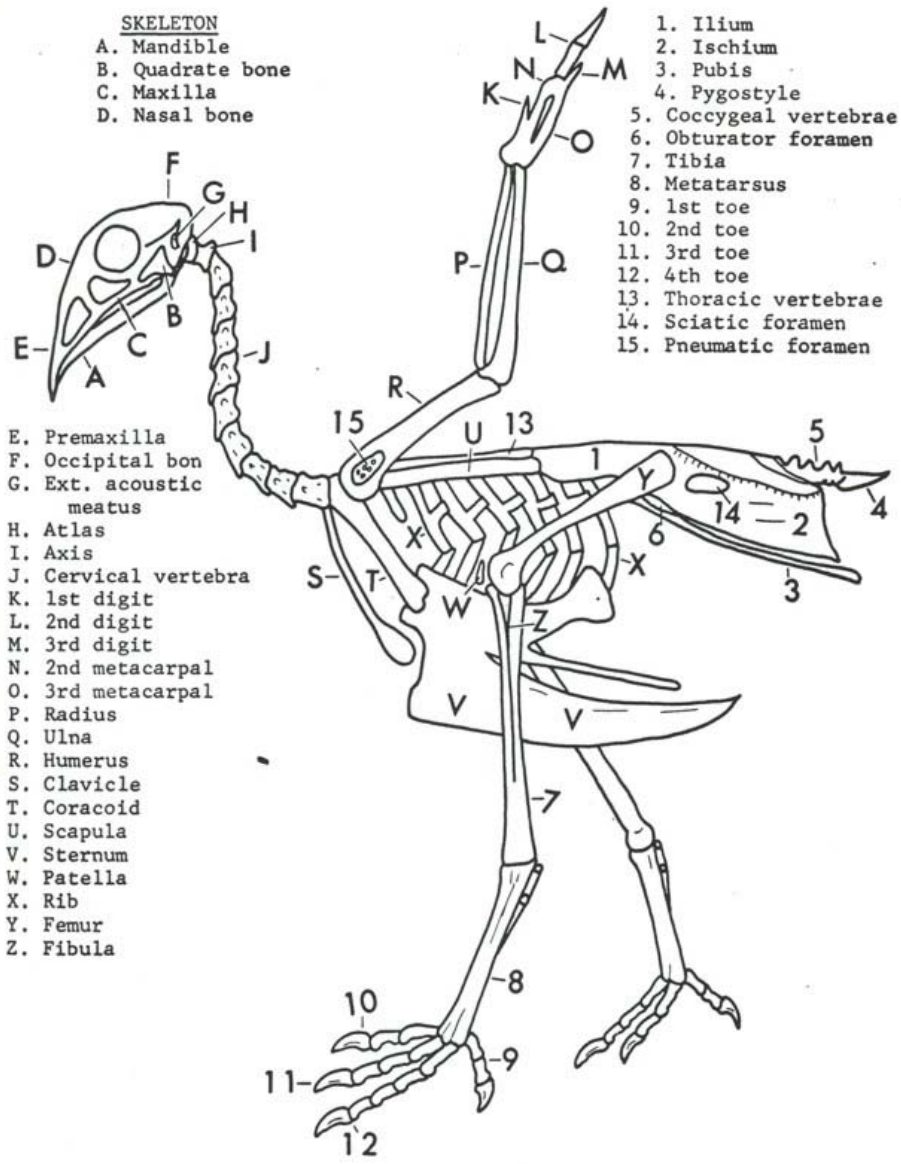
However the earliest evidence is that from Cishan which is as early as 5400 BC. Therefore, domesticated fowls were found in China before 5400 BC and this is the earliest record in China.

At present there is no consensus of opinion about the time and location of the origin of the domesticated fowl. However more people believe they were originated in India. The main evidence of this school of thought is that there are still Gallus gallus (L) in the wild in India today and there are some archaeological evidences.

With regard to time of origin Charles Darwin (1868) believed it happened in India around 1200 BC. British archaeologist Zeuner (1963) estimated there were domesticated fowls in India before 2000 BC. The estimation was based on pattern of two fowls excavated from Mohenjo-Daro which he believed to be Gallus sonnerati (Temminck). Carbon dating has estimated the excavated site to be artifacts of fowl made of clay were also unearthed at this site.



~General area of recent chicken bone recoveries in North China.~



Sewell and Guha (1931) studied chicken bones unearthed from Mohenjo-Daro and found the length of the drumstick to be 103 mm compared with 69 mm and 115 mm for those of Gallus gallus (L) and modern domesticated fowl respectively.

Based on these three pieces of evidence domesticated fowl started in India around 2000 BC. They were then introduced to Egypt around 1400-1500 BC. Carter (1923) discussed patterns of rooster on broken pieces of ceramics excavated from tombs in Tut-Ankham, India, and found them to exist around 1350 BC. Domesticated fowls were introduced from India to northern Iran and then westward to Mesopotamia and Asia Minor in around 1000 BC. Later on around 5-600 BC they were introduced into Europe.

It can be concluded domesticated fowls occurred earliest in China around 5400 BC; far earlier than the record in India of around 3500 BC.

The word fowl was found in engravings on turtle bones of 1600-1100BC. Besides morphology and measurements, there are additional evidence proving the fowl bones from Cishan were domesticated fowls. It is possible because of certain religious rites. Most of the metatarsus were of male fowls. Male fowls were chosen rather than female fowls. On the other hand like people nowadays females were kept for egg production and surplus males were killed. These may help to explain why the specimens were dominated by male tarsometatarsus. However some archaeologists believed selective hunting by hunters could also have produced similar conditions. Included in this paper was a further account of the Cishan discoveries entitled

The animal remains discovered at Cishan village, Wu'an, Hebei Province

by Chow Ben-shun - The Neolithic site at Cishan Village, Wu'an County, Hebei Province, lying at the eastern foot of the Taihang Mountains, on the terrace near the Nanming River, 25 metres above the present day river bed, belongs to one of the two earliest cultures so far discovered in North China, whose earliest known occupation is dated 5405-5285 radiocarbon years BC (5570 half-life: ZK 439, ZK 440). A considerable amount of Neolithic artifacts and animal remains have been unearthed from this site. The animal remains are all rather fragmentary and some of them bear traces of having been burt, which represent at least the following 23 species.

Myospalax psillurus, Milne-Edwards -- Lepus tolai, Pallas -- Macaca mulatta, Zimmermann -- Meles meles, L. -- Paguma larvata, Hamilton-Smith -- Panthera pardus, L. -- Canis sp., Canis familiaris, L. -- Cervus nippon, Temminck -- Cervus claphus, L. -- Elanhurus davidianus, Milne-Edwards -- Capreolus, L. -- Hydropotes inermis, Swinhoe -- Muntiacus muntjak, Zimmermann -- Cervus sp., Bos exiguus, Matsumoto -- Sus domestica, L. - Sus scrofa, L. -- Gallus gallus domesticus (L.) -- Anser (L.) -- Emydidae G. et sp. indet.. Ctenopharygodon idellus (C. et V.) and Lamportula sp.

Among the animals mentioned above, the dog and pig were certainly domesticated, the ox might or might not be livestock, and the chicken was very likely to have been domesticated, while the rest were wild animals. Of the identified bones 60% were of domestic animals and 40% of wild animals, but there was greater variation of the number of individuals among the wild animals. This shows that though agricultural production was fairly developed in the Neolithic Age in Cishan, traditional economic activities of hunting, fishing and gathering still occupied an important place in people's life.

A large quantity of remains of domestic chickens (Gallus gallus domesticus) unearthed may prove, based on a comparative study of data obtained in and outside China, the chicken of Cishan site may be the earliest archaeological record of domestic chickens found so far.

Gallus gallus domesticus (L.)

Table 4

T86(2) H402	T86(2) H402b	T77 H37	T89 H412	T77 H310	T89 H411	T86(2) H402a	T89 H411	T89 H411a	T82 H392	T82 H312	T82 H372	T86(2) H402c	T89 H412
86.5	85.5	750	74.5	83.0	80.0	75.5	77.5	85.5	73.5	76.0	72.0	82.5	70.0

Table 5

Gallus gallus domesticus (L)	Gallus gallus (L)	Pucrasia macrolopha (Lesson)	Chrysolophus pictus (L)	Crossop-tilon mantch-uricum (Swinhoe	Phasianus colchicus karpowi (Buturlin)
72.0--86.5 (79.0	70.0--82.0 (78.7)	57.0-(62.3 (52.9)	73.0-75.0	92.0-101.	590-63.0 (61.9)
70.0	62.0-68.0	46.0-58.2	68.0-76.0	89.0-97.0	46.0-55.0

The above tables are those referred to in the text on Zhou Ben Xiong's paper, although not complete because of translation problems I feel are still relevant.

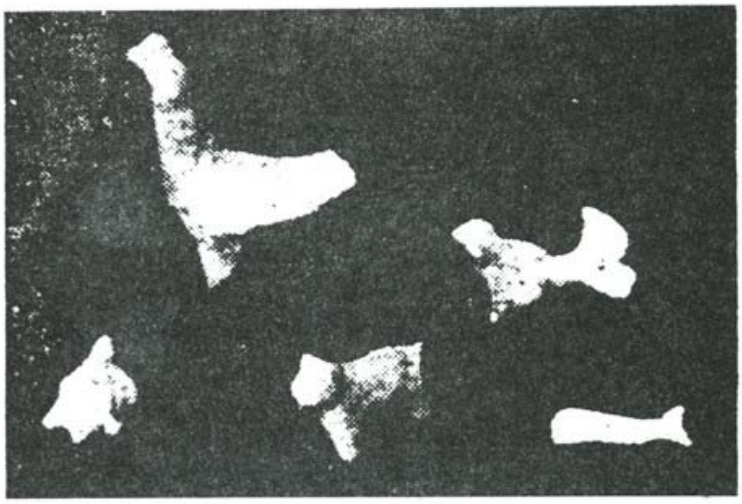
With reference to the illustrations, supplied by Dr. Han Defen of the Institute of Vertebrate Paleontology and Paleoanthropology in Beijing, China, with a personal communication of 21/7/85, the details of Fig. 1 and Fig. 2 are as follows:

Fig. 1 is a metatarsus bone of Gallus sp. which was taken from a paper entitled ANIMAL REMAINS OF NEOLITHIC SITE OF BANPO, SHAANXI (Li Yiuxian et Han Defen).

Fig. 2 This earthenware model is taken from HISTORICAL RELIC 1955. However Dr. Han Defen advises that he could not find any description in that paper. The only information I have at this point of time is

that it was found at the Qujialing site (dated to the third millennium) at Tianmen in Hubei (Rodwell). I would assume that the photograph Fig. 2 is the one referred to by Rodwell.

8B



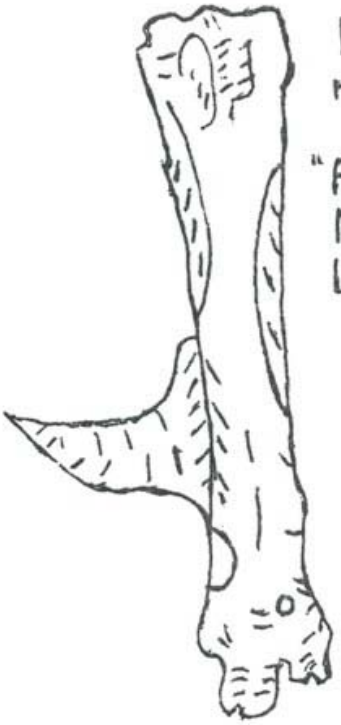
Earthenware model of Chicken from Tianmen, Hubei-China —

Fig 2

8 A

Fig 1

Metatarsus bone of Gallus sp. from Neolithic site of Banpo, Shaanxi — China. —



For comparison male metatarsus from "Avian Anatomy" — McLeod, Trotter and Lumb - 1964 —

Fig 3

Photos from — Dr. Han Defen —

Although the comb is not clear and the tail of low profile Fig. 2 does somewhat resemble the Jungle fowl. To me it does not show a likeness to either the Malay or the Asiatics, thus we must assume that the Gallus Bankiva or associated species existed in China at the third millennium. This of course does not exclude however either the Asiatics or Gallus Giganteus (Malay) being present as well, for when we look at Fig. 1 the metatarsus from the Neolithic site of Banpo in Shaanxi we see-a downward direction

of the spur which I would expect to indicate perhaps Gallus Giganteus or an Asiatic. I received no measurements of this metatarsus from Dr. Han Defen (length or diameter). This information would perhaps indicate from what species it may have come.

When we look at the illustration of the metatarsus bones from Cishan the spur is more or less in a neutral situation, No. 1 and No. 3 have a slight upward trend, whilst No. 4 very slightly downward.

Zhou suggested the Cishan bones belonged to the Jungle fowl (Bankivoid species). Fig. 3, the illustration of a metatarsus was included for comparison purposes, although the spur is perhaps exaggerated.

A point which appears evident to me in Fig. 1 is the strong, robust nature of the lower section of the metatarsus suggesting the toes also being of a strong nature suitable for digging purposes, which may further suggest its owner could be a "runner" (Malay) rather than a "flyer" (Bankivoid) following along Finsterbusch's (1979) deliberations. It would be interesting to know something of the bone structure and measurements of the Banpo metatarsus in Fig 1, once again using Finsterbusch's definitions for comparison.

From the foregoing information on the North China discoveries they predate earlier documented discoveries in both India and Thailand by perhaps some 1500 years. As far as I can ascertain the school of thought was that the domestic and wild fowl originated in India and spread westward, eastward and then in a northerly direction.

The Cishan discoveries suggest that with the evidence we now have is that this movement could have been in reverse. At the moment I will not elaborate on this suggestion because I feel more information will come to hand before I complete the whole treatise. I also feel much more evidence will come out of China in later years which will possibly fill in some of the gaps that still do exist.

The bones depicted in Fig. 4 are from Zhou's paper and I assume from the Cishan site. As far as I can determine from the translation No.1, No. 2, No. 3 and No. 4 are metatarsus. No. 2 and No. 3, left metatarsus (nearly complete), No. 7 humerus (elbow), No. 8 front hand, No. 10 clavicle (lock bone), No. 6 femur (right).

I will stand to be corrected for I am not an osteologist. Perhaps my readers can identify the rest of the bones from Fig.4.

New Species from Europe

I received a personal communication and a paper written by him entitled A NEW JUNGLE FOWL FROM THE PLEISTOCENE OF EUROPE from Dr. Colin Harrison, of the British Museum (Natural History) sub department of Ornithology, Tring, Hertfordshire provided some very interesting and informative facts.

First I will quote Dr. Harrison's communication 29/4/85: "Thank you for your letter concerning the Domestic Fowl. While identifying fossil bones I came on remains of a Gallus species in the middle to late Pleistocene of England, not apparently associated with human activity. I considered that these were not of the same species as the Indian Red Jungle fowl Gallus gallus and, as you win see-from the enclosed separated, I named the new bird Gallus europaeus.

I summarised slightly more complete evidence on truly fossil Gallus for a book on domestic fowl in archaeology which is being prepared by Dr. Brothwell of the Institute of Archaeology in London. When I prepared an Atlas of the birds of the Western Palaearctic (Collins 1982) I listed some of the distribution patterns resulting from the Pleistocene glaciations of Eurasia as a whole. In many instances two species occurred, a western and an eastern one, on either side of the cold Tibetan-Altai barrier. In some instances a third. species was also present in the Indian region south of the Himalayas.

In the case or the Jungle fowls there appeared to be a pattern like the last, and I commented in the enclosed paper on the apparent absence of the third species in eastern Asia. Sally Rodwell's findings on the jungle fowl bones in a Northern Chinese stone-age culture, eight thousand years ago, unconnected with the Indian birds and antedating the assumed domestication of the Red Jungle fowl by several thousand years, appears to provide the missing part, completing the distribution pattern of these forms. By analogy with other species groups it seemed most likely that these had, in isolation, achieved the rank of separate species. If the European Junglefowl survived the last glaciation, then the finds of very early Gallus in Europe might be referable to this species and not, as had been assumed in the past, evidence of the spread of domesticated Red Junglefowl. It screws up the picture.

If the hypothesis is correct then the full range of domestic breeds at present assigned Gallus gallus might conceal the presence of three separate genotypes or hybrids. Thad hoped that Sally Rodwell would have been able to write this up as her Ph. D. thesis but she appears to have run into difficulties. I would be interested to see your booklet on bones, but as some comments in my paper indicate, a cautious re-appraisal is needed in a number of cases, particularly for 19th century identification".

The nature of my exercise has always been to search out as much information as I could find available, put it together so that it can perhaps be enlarged upon to the benefit of us all. Therefore, when I came to Dr. Harrison's paper I felt that to condense it would prove most difficult, for to me it is all very relevant to the subject under discussion. To endeavour to condense it may affect its content. The reader will find it most informative.

So from Journal of Archaeological Science 1978, 5, 373-376 A NEW JUNGLE FOWL FROM THE PLEISTOCENE OF EUROPE C. J. O. Harrison of British Museum (Natural History) Tring, Herts: "The domesticated Red Jungle Fowl Gallus gallus is believed to have been dispersed by man from India during the Holocene. The distal end of a radius from the Ipswichian Interglacial deposits at Crayford, Kent, was indistinguishable from that of the wild form of Red Jungle Fowl. A coracoid from the early Middle Pleistocene of Norfolk was also very similar to that species but showed differences comparable with those found between different species of Gallus. At least one species referable to Gallus is known from the Pliocene of South-eastern-Europe. Extrapolating from zoo-geographical speciation patterns it would be possible for a Gallus species to have evolved through Pleistocene speciation in the European region. The species might have become extinct during a glaciation or have been exterminated by early man. A new species Gallus europaeus is described with the coracoid as a holotype, and the radius from Kent is tentatively referred to it. Key words: Britain, Pleistocene, Jungle-Fowl, Gallus.

INTRODUCTION

The Red Jungle-fowl Gallus gallus is the first bird species known to have been domesticated by man. It has-a long history of domestication in the Indian region where it originates and is usually thought to have spread with human civilization westwards through the Middle East to Europe. Zeuner (1963) suggested that it reached the Mediterranean by the 8th century BC, and states that the Bronze Age would have been too early for its occurrence in Britain. Mourer-Chauvire (1970), however, records it from the Greek island of Kitsos in the Neolithic. Although there are some doubts about the precise period in which the domesticated form of the Jungle-fowl first occurred in any particular area, the general picture is of a dispersal from Asia during the Holocene.

EARLY BRITISH SPECIMENS

When bird bones of the Ipswichian Interglacial from the Thames Valley were restudied (Harrison & Walker, 1977) a distal end of a radius (BMNH A489) originally assigned to a duck "Querquedula", appeared to be referable to Gallus gallus and with a similar size to that of the wild form. The site is not one in which the accidental introduction of later material is likely. There is evidence of the presence of man in the area during the Ipswichian Interglacial.

We suggested that there could be 4 different interpretations of the presence of such bones. It might be regarded as evidence that the material was wrongly dated, or that it was correctly dated and changed our knowledge on the distribution of the species as a domestic bird at this period. It might indicate the presence of a phasianid species, not necessarily Gallus gallus, which is still extant and had occurred over a wider range at an earlier period, or that a now extinct species osteologically similar to Gallus gallus had occurred in that area at that time.

In the case of the Ipswichian specimen the first possibility appeared to be ruled out, there were also reasonable doubts about the second one and osteological comparisons appeared to exclude the third.

More recently, while examining material of the Cromerian Interglacial complex from East Anglia, I have re-examined a left coracoid of a bird from the Green Collection, from the Forest Bed, Ostend, Norfolk, BMNH 18239. This was originally identified by Lydekker (1891) as that of a (young individual of the Capercaillie Tetrao urogallus; a diagnosis which appears to have been strongly influenced by pre-suppositions concerning the range of species likely to occur, the suggestion of immaturity being used to explain away the small size of the specimen although there is no indication of the incomplete ossification which might be expected during growth. The museum label had been amended at some time to read "Gallus sp."

A careful comparison of the specimen with Recent osteological material confirmed that it is referable to the Phasianidae and not to the Tetraonidae, and that within the former it is referable to the genus Gallus. The specimen is a fossil typical of other material from that period and region, and there are no grounds for suggesting that it is of more recent origin. It was, therefore, necessary to determine whether the specimen was referable to Gallus gallus or to some other, possibly new, species within the genus. There are 4 extant Gallus species, all in the Oriental region. In structural characters the coracoid differs from those of Grey Jungle-fowl Gallus sonnerati, Ceylon Jungle-fowl Gallus lafayettei and the Green Jungle-fowl Gallus varius, and is closer to Gallus gallus. Five specimens of wild forms of the latter species from various regions were available and these showed a constancy of structure from which the fossil varied in some aspects of the sternal facet, sternal foramen and furcular head. In terms of coracoid structure these differences were comparable with those which separate the other species. It is therefore preferable to regard the new form as a separate species.

ZOOGEOGRAPHICAL CONSIDERATIONS

This proposal would be consistent with the patterns of zoogeographical dispersal within the Eurasian region. Evidence of distribution prior to the Pleistocene is not very helpful. A single species, Gallus aesculapii Gaudry 1862, has been described from the Lower Pliocene of Greece and the Black Sea region. This had a tarsometatarsus similar in size to that of Gallus gallus, but a much longer coracoid. Gallus bravardi Gervais 1859 was described from the Middle Pliocene of France, using a rather different concept of a genus, the description of the material suggesting it was referable to the Phasianidae in the broad sense rather than generically identifiable as Gallus.

The recent species occur S of the Himalayas; gallus from Kashmir to Malaysia, Indochina and Indonesia, sonnerati in southern India, lafayettei in Ceylon and varius in southern Indonesia. It is likely that they speciated within these regions. For birds which in late Pliocene and early Pleistocene may have had a single population extending across the Eurasian continent, the glaciations tended to isolate populations in warmer, usually southern refuges. In forest species this often produced 3 forms, usually regarded as species -- a western one derived from a Mediterranean or Middle East refuge, an Indian one and one in far eastern Asia.

The Himalayas and Tibetan plateau appear to have functioned in many instances as an effective barrier to a subsequent northward spread of any Indian form in the later Pleistocene and possibly earlier, but the other two forms usually spread northwards and in various genera may now meet parapractically or sympractically in Mid-Siberia.

In the case of Gallus only the Indian forms are present, of which Gallus gallus is the likeliest to have been involved with any Eurasian populations. Survival in a glacial refuge may have depended in part on an absence of competing species occupying a similar ecological niche, and the large complex of pheasant species in eastern Asia may have prevented the survival of a Gallus species in that region. There would appear to be no obvious competition in Europe and the survival of a form of Gallus in this region, expanding back into its northern parts during the interglacials, might explain the presence of the fossil specimens now under discussion.

If the western species persisted through much of the Pleistocene it may have been exterminated during a glaciation or survived to be hunted to extinction by man, as in the case of the large Crane (Harrison & Cowles, 1977). In either instance the occurrence of a a bone of a wild-type Jungle-fowl in fossil material might indicate the presence of such a bird rather than, as has been assumed until now, indicating the presence of a domesticated fowl. Many of the present records of domesticated fowls may also merit re-appraisal. For example, the references in Lydekker (1891) and Lambecht (1933) to bones of Gallus from cave deposits in the Lahn Valley of Germany prove on re-examination to refer to bones of Tetrao urogallus. The earliest example of domesticated Gallus gallus that I have examined is from Hanging Langford Camp, Wyelye, Wiltshire, assigned at the time of collection to the early Iron Age.

SPECIES DESCRIPTION

GALLUS EUROPAEUS SP. NOV.

Etymology: The scientific name refers to the region in which the species is known to have occurred.

Diagnosis: Coracoid similar in general size and shape to that of Gallus gallus. Sternal articulation long and broad, the ventral surface forming a distinct stout lip. Ventral articulation deep for most of its

length. Sterno, coracoidal foramen small and rounded with shallow sterno-external fossa. Brachial tuberosity of head arched sharply over triossal canal.

Material: Holotype a left coracoid, BMNH 18239, Rev. C. Green Collection, purchased 1843. Tentatively referred specimen a distal end of a left radius, BMNH A489, presented by F. C. T. Spurrell in 1894.

Occurrence: Holotype -- Cromer Forest Bed Series, early Middle Pleistocene; Ostend, Norfolk. Referred specimen -- Ipswichian Interglacial, Upper Pleistocene; Crayford, Kent.

Description and discussion: The holotype is a coracoid in good condition, lacking only the external extremity of the sternal end. In size and shape it is most similar to the wild form of Gallus gallus, sonnerati and varius being larger, and lafayettei being smaller and slimmer. The sternal facet is broader than that of Gallus gallus, particularly at the internal ventral surface where the internal end forms a projecting and ventrally twisted lip. It is a little larger and stouter at its external end than that of Gallus gallus, and the dorsal portion of the surface of the facet is of fairly even width, projecting as a slight ridge at its distal edge and with only a slight indication of the small distal groove bordering it. The sternocoracoidal foramen is small and rounded. In some other species it is larger, more irregular and tends to merge with a deeper sternal-external fossa, although in Gallus lafayettei it is shallow and barely apparent. The shaft is moderately stout, and in this and in the way in which the brachial tuberosity arches in a prominent, beak-like projection it is more similar to Gallus sonnerati and Gallus varius than to Gallus gallus. The distal end of a left radius has no distinctive characters but resembles that of the wild Gallus gallus in shape and size. Its occurrence at an early date suggests that it might be referable to the new species rather than the latter.

Measurements: Holotype: Length 50 mm; internal sternal tip to nearest tip of brachial tuberosity 42.5 mm; sternal facet, internal/external length 11.5 mm; greatest internal width 3.1 mm, width at external end 2.0 mm; internal and external depth of dorsal portion of facet 2,0 and1.5 mm; external end of sternal facet to sternocoracoidal foramen 4.4 mm; diameter of foramen 1.4 mm; width and thickness of shaft at mid-point 5.1 and 4.5 mm; internal/external width of head 7.8 mm; dorsoventral thickness of brachial tuberosity 6.5 mm.

Notes from Zeuner 1963

At the time of writing and publishing CHICKEN BONE RECOVERIES (1984) I had not sighted Zeuner's work DOMESTICATED ANIMALS (1963). Since then I have been fortunate in obtaining relevant information to this study from this publication and feel it should be included in this supplement.

Zeuner speaks of Sewell's (Sewell and Guha 1931) study of bones from Mohenjo-Daro in the Indus valley a femur which measured 103 mm compared with 69 mm in the wild bird (which I would assume would be Gallus gallus, Gallus sonnerati and associated species). Zeuner also quotes the femur of a . modern table fowl (coll. Institute of Archaeology) as measuring 115 mm. This may suggest that the femur from Mohenjo-Daro was not Gallus gallus, but perhaps Gallus giganteus. The dating there appears to be around 2000 BC.

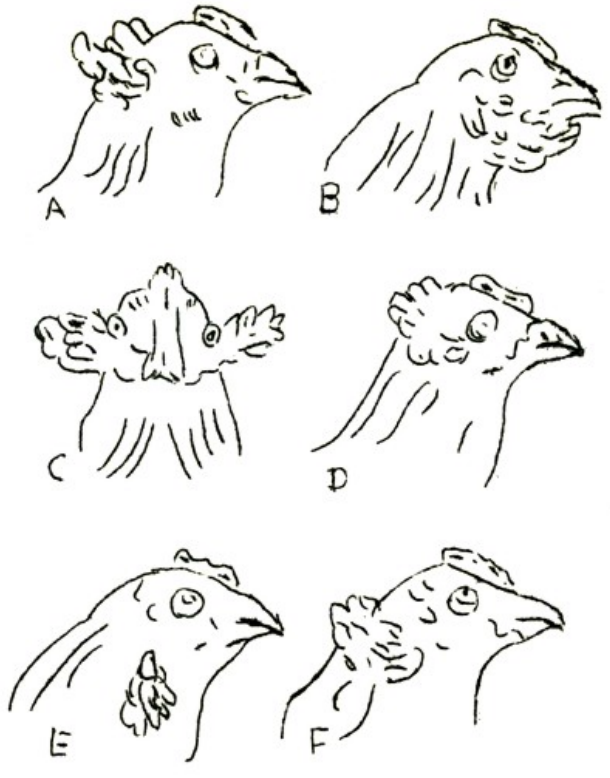
Quoting from Zeuner: "In Switzerland the fowl appears in a settlement of the Rauraci at Basle Gas Works which according to Hexheler and Kuhn (1949) must have been abandoned before 58 BC. The evidence consists of bones. Late La Tène tombs at Nauheim in Germany also contained bones. The pre-Roman Celts of Britain had the fowl. This is specifically mentioned by Caesar in De Bello Gallico and confirmed by its effigy on Belgic coins as well as two finds of bones. There is one record from Kingsdown Camp, near Wells in Somerset, where Jackson identified some bones of a small fowl. The more important site is pre-Roman Colchester, in Essex where Bate found domestic fowl among the bird remains from the primary silt of ditch 1 (about AD 10-43)." This was discussed in Chicken Bone Recoveries page 15, 1984.

Again from Zeuner: "An almost contemporary specimen comes from Hanging Langford Camp, Wyelye, Wiltshire, where Belgic first century occupation predominates, though Romano-British material occurs also. Here the fowl may be just prior to the Roman Conquest or just later. Several British caves have yielded remains of fowl but nowhere could a pre-Roman date be proved. Among these sites are the Chudleigh Fissures in Devon, Goughs Cave in Chedder Gorge Somerset, Ravencliffe Cave in

Derbyshire and Heathery Burn Cave in Durham. From the time of the Roman Conquest appears to come a group of five contracted burials in High St. Winchester. Two of these had the skeleton of a fowl between their legs. Whilst C. F. C. Hawkes was at first inclined to consider them as Bronze Age (which would be too early for the birds in any case), he later compared them with the crouched burials of Maiden Castle with their joints of mutton, and is now somewhat inclined to regard the Winchester burials also as of conquest date. Roman sites in Britain, like London, Silchester and Caerleon, have produced bones of fowl, sometimes of larger size and with tarso-metatarsi equipped with large spurs, suggesting that the sport of cockfighting was popular. In Central Europe, too, Roman sites contain remains of domestic fowl for instance that of Niederbieber near Neuwied on the Rhine, Vindonissa in Switzerland, Stillfriend on the March (Austria, on the border of Moravia) and Hallstatt-Lahn (Austria). An interesting discovery was made at Leuna in the province of Saxony, which was outside the Roman political sphere. The Germanic cemetery of Leuna comprises some very rich graves which have informed us about culinary practices more fully than many others. This matter has been discussed by Gandert (1954) both as regards the pig and the fowl. Three male and one female fowl were found. The female lays in Grave No. 2. It lacks the head and feet but not the tibia. Returning to Leuna, excavation reports indicate that the cocks were not associated with the plates of food. Moreover, all three had retained their feet, and the cock of Grave No. 3 had spurs. The heads, however, were missing. This interpreted by Gandert as evidence that they were sacrificed birds, killed by tearing off the head."

This information presented by Zeuner of course is late in time when compared with recent discoveries in China (Zhou and others) and NE Thailand (Higham). Nevertheless I feel all facts regarding discovery of evidence of the presence of chicken through the ages should be documented. This I am endeavouring to do so that the opportunity will be open for others to add to it and perhaps fill in the gaps of which unfortunately there are still many.

Araucana chicken ear-tufts



TYPES OF EAR-TUFTS - A - back swept; B - front swept; C - horizontal;
D - vertical; E - tear drop; F - back swept.

The above sketches show the different configurations in the Ear-tufts of the Araucana chicken, the origin of which was discussed in CHICKEN BONE RECOVERIES (Plant 1984). These sketches were copied from EAR-TUFTS: A SKIN STRUCTURE MUTATION OF THE ARAUCANA FOWL, Ralph G. Somes Jr. of the University of Connecticut, Storrs. The original sketches were drawn by Jack Arrell. The complete paper was published in THE JOURNAL OF HEREDITY 69: 91-96, 1978.

Since the publication of "Chicken Bone Recoveries" (1984) I obtained a copy of Professor Somes' paper hoping that it may contain some information supporting my theory of a possible origin of the Araucana chicken. Unfortunately I could find nothing except perhaps the Pea comb as shown in the sketches to support my theory. In my hypothesis I did not take into consideration the traits of either ear-tufts or rumplessness which occur in the Araucana.

Somes writes as follows: "At the present time it is morphologically a very heterogeneous breed with no universally accepted standard. The only feature common to all strains of Araucanas and the one that distinguishes them from other breeds is blue egg shell colour. Two other unusual traits that are usually associated with this breed are rumplessness and eartuftedness, although the presence or absence of either or both of these characteristics is apparently optional in the makeup of the breed."

Somes goes on to say: "That the ear-tuft trait of the Araucana breed is the heterozygous expression of a single dominant autosomal gene. When homozygous, this gene acts as a complete prenatal lethal; it also would appear to be prenatally lethal in about 20% of the heterozygous that carry it."

The eartuft trait is assigned the gene symbol Et. I will not go into any great detail on this subject except to say that the presence of eartufts in Araucanas is somewhat variable and therefore does nothing to support my hypothesis, although perhaps it would be reasonable to assume that the ear-tuft trait was present in the local Indian's chickens in Chile and not introduced from an Asian source as I suggested previously (1984) the Pea comb may have been. Somes states that both blue egg shell colour and rumplessness have been previously presented by Hutt.

In my quest for further information on the origins of the Araucana chicken (discussed in Chicken Bone Recoveries 1984, and also this Supplement) I received from Dr. Roberto P. Schlatter, Instituto de Zoologia, Universidad Austral de Chile, Valdivia, Chile, a personal communication and a paper on the subject dated 24th September 1985. The communication reads as follows: "I acknowledge receipt of your kind letter and unfortunately we do not know about archaeological findings related to Gallus species; there are for the moment no concrete antecedents, but possibly they have not been registered in the field. Oldest archaeological sites are not older than 14,000 years in southern Chile. As you well mention, the Araucana breed is somewhat clouded and polemics about it are still going on. I am enclosing a photocopy of an endemic article which may help you for cross reference and also local Chilean information. As you notice they talk even about a different species. Research on egg colours reveal that it is a metabolic problem of biliary secretions on bird shell egg probably similar to other wild birds which also have blue eggs."

The paper sent by Dr. Schlatter and not as yet translated was from Rev. Chilena Hist. Nat. 55. (1963) 93-107 OBSERVACIONES ACERCA DE LA GALLINA ARAUCANA (Gallus inauris Castelló, 1914) (2a Comunicacion por el Prof. Dr. Ottmar Wilhelm, G.) I hope at a later date to have this paper translated from Spanish, as possibly may contain some helpful information. The Bibliography also appears interesting, some of the references alluding to the Araucana. Some of these would also appear to be in Spanish.

Fossil discoveries from China

As anticipated further material is coming to hand regularly and from an enquiry directed to Dr. Hou Lianhai of the Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, I received from him during October 1985 a number of papers relating to the discovery of Avian fossil remains, some of them in recent times in China. These discoveries came from the Pleistocene, Middle Miocene, Upper Miocene and Lower Cretaceous periods. The papers are mostly written in Chinese, but partly in English and I will endeavour to extract what material I can relevant to this study.

It would appear that Dr. Hou Lianhai has done extensive study in this field and my point in bringing this information forward is the fact the genus Phasianus has appeared amongst these discoveries, in fact a new species, which in turn is related to Gallus. Beginning from ACTA ANTHROPOLOGY SINICA Vol IV No. 2 1985 comes the following relevant text.

"UPPER MIOCENE BIRDS FROM LUFENG, YUNNAN -- Hou Lianhai (Institute of Vertebrate Paleontology and Paleoanthropology Academia Sinica) - Key Words: Late Miocene; Aves.

Summary - The discovery indicates the first fossil record of fossil birds from South China. 3 Orders, 3 Families, 6 Families, 6 Genera, 6 Species, including 2 new species are described in the present paper

They are Anas sp; Aythya shihubas sp. nov.; Bambusicala sp.; Diangallus mious gen. et sp. nov.; Phasianus lufengia sp. nov.; Yunnanus gaoyuansis gen et sp. nov.; and order family indet. The fossils were collected together with Ramapithecus, Sivapithecus and other vertebrate animals by a field party of IVPP. in Upper Miocene in Shihuba, Lufeng County, Yunnan Province during 1980-1984. This is the brief report of my paper "Upper Miocene birds from Lufeng, Yunnan, China".

Family: Phasianidae - Genus: Diangallus gen. nov. - Diangallus mious sp. nov. - Characters: The size similar to Gallus, tarsometatarsus wider, bone wall thick, calcar long and curved, tubercle for tibialis anticus very large, trochleae for digits 3 arch..

Genus: Phasianus Linnaeus - Phasinaus lufengia sp. nov. - Characters: Similar to Phasianus, but the difference with the other species in the following: (1) tibiotarsus shrink, antero-posteriorly not flat; (2) inner condyle and outer condyle of tibiotarsus expanded anterior intercondylar fossa deep and wide; (3) tarsometatarsus more slight than other species; (4) trochleae of distal end of tarsometatarsus slightly arched.

The next paper, although not directly concerning Gallus serves the purpose of giving details of a geological site which may at a later date yield further information and is from SCIENTIA SINICA (Series B) Vol. XXVII No. 12 December 1984 A NEW FOSSIL BIRD FROM LOWER CRETACEOUS OF GANSU AND EARLY EVOLUTION OF BIRDS Hou Lianhai and Lia Zhicheng (Institute of Vertebrate Paleontology and Paleoanthropology, Academia Sinica, Beijing) Received December 27, 1982, revised May 13, 1983.

Abstract - A new order of Aves, Gansuiformes, is established on the basis of the fossil specimens, including a tibiotarsus and a tarsometatarsus with four complete digits derived from the Lower Cretaceous of Yumen, Gansu Province. The new bird probably the oldest one in continental deposits. As Archaeopteryx is now considered as the ancestor of all land birds, Gansus, the new bird is supposed to be the ancestor of shorebirds and water birds. Gansuiformes is similar to Charadriiformes and some water birds in certain characters. In the summer of 1981, Ma Fenzhen, Liu Zhicheng, Huang Shaochu and Nui Shawie found the distal end of a left tibiotarsus, a left tarsometatarsus with four complete digits in the Xiagou Formation, Yumen, Gansu Province. It is a bird of an early age in avian history and new to science. The fossil bird is described in the present paper. A description of the Xiagou Formation of Shenjiaivan has been made by the Gansu Regional Geological Survey Team. The fossil bird associated with some telecost remains has been found in the third layer of the Formation which is considered to be of the Lower Cretaceous in age. Descriptions Gansus gen. nov. - Type of Genus Gansus yumenensis sp. nov. - Diagnosis: Same characters with the new species.

I will not go into details of this species, but from the same paper: "The other known Early Cretaceous birds are, Enaliornis barretti, E. seelgwiki-Seely, 1864 from England., Gallornis straeaeloni-Lambrecht, 1931 from France. Ambioriiformes Kurochkin, 1982 from Mongolia, and indeterminate feathers from Australia. The age of Gansus is about 1.35 m.y., the earliest known shorebird."

From "Vertebrata PalAsiatica" - Vol. XXII No. 1 January 1984 and again by Hou Lianhai he speaks of A new genus of Vulture-Subfamily Aegypinae, Genus Mioaegypius, nov. which he describes in his Summary. "In 1982,some fossils of birds with mammals were found in Xiacaswan Formation (Middle Miocene) of Sihong, Jiangsu Province by Gu Yumin.

From "Vertebrata PalAsiatica" - Vol. XX No. 4 October 1982 comes "Brief Report on Avian Fossils of Pleistocene from Zhoukoudian, China" by Hou Lianhai. (Institute of Vertebrate Paleontology and Paleoanthropology, Academia Sinica)

Abstract - Over ten thousand bird fossils, from 1927-1980, were collected from the caves of Pleistocene of Zhoukoudian where are rich in fossil birds, especially in Loc 1 of Peking Man site. The author has studied these birds in order to greet the 50th Anniversary of the finding of the First Skull of Sinanthropus pekingensis. This is the brief report of my paper, "Avian Fossils of Pleistocene from Zhoukoudian, China", as which is still in the press. It includes 13 orders, 31 families, 78 genera and 124 species of Early Pleistocene to Late Pleistocene, among them one genus and five species are new ones."

In the foregoing paper there is a small reference to Galliformes and Phasianidae which I have not as yet had translated. From "Vertebrata PalAsiatica" Vol. XXII No. 2 April 1984. "Vertebrate Fossils from Yunshui Cave, Beijing" Huang Wanpo - Hou Lianhai - Key words: Yunshui cave; Late Pleistocene; Vertebrate fossils.

Abstract - A new species of Phasianus, P. yanshansis and some mammalian fossils were described in this article. They were found in Yunshui Cave, Fangshan county, Beijing in 1980-81. Phasianus yanshansis is characterised by its more lower skull, thick supraorbital ridge with a lot of the dorsalspine in the frontal, deep temporal fossa and large prominent cerebellaris. It represented a more advanced form of Phasianus. The fossil bearing deposit is approximately of the age of the upper cave of Choukoutien C14 dating on 18,540 + or - 250 years BP.

The foregoing material at first sight may not appear important to the study of the Gallus species. However, I feel that if we are to discover something of the evolutionary process of Gallus, material coming from these geological sites in China will eventually surface providing us with evidence of Gallus, for as will be noted species of Phasianus have already appeared.

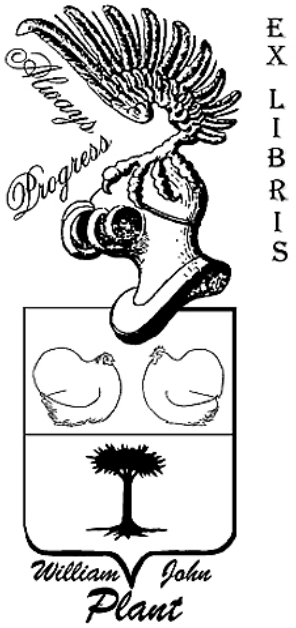
Hutt (1929) stated: "The domestic fowl belongs to the genus Gallus of the subfamily Phasianinae." Therefore the possibility arises that the presence of Gallus may also become apparent along with the Phasianus. It will be noted that most of these discoveries are of a recent nature and perhaps within the next decade I suggest we can expect some positive evidence of-fossil Gallus remains coming out China. They may even be around at this point of time although I am not aware of it, but would not be surprised.

The overall subject of my study is intended to cover the evolutionary process from the first fossil bird, Archaeopteryx, through to the Gallus species. However, I have purposely held back on this facet of the early origins mainly, through lack of information and evidence. However, now with this latest information from Hou Lianhai we have another link in the chain with the discovery of the Gansus.

We now have Archaeopteryx (Late Jurassic) -- Gansus (Early Cretaceous) -- Hesperornis Late Cretaceous) and Ichthyornis (Late Cretaceous). Perhaps soon more links will appear in the chain. I will however stay my hand a little longer in this area of the study, hoping there will be more to discus: a little later on.

Whilst reference is being made to the first fossil bird, Archaeopteryx, perhaps it may be in order to mention that at the time of writing (1985) apparently there has been doubt cast upon the authenticity of the specimen of Archaeopteryx in the British Museum. I received this information through my good friend Dr. Bill Longenecker of the National Agricultural Library, Beltsville, Maryland in the United States, in the form of a press cutting from the "Washington Times", dated 20th September 1985 entitled "Archaeopteryx or Piltdown Chicken? -- Ruffling feathers with hints of hanky panky along the evolutionary trail". The report was written by columnist, William A. Rusher.

Mr. Rusher discusses the fact that a group of modern investigators, including the very eminent cosmologist Sir Fred Hoyle have denounced Archaeopteryx as a fraud, presumably committed by the late Dr. Haberlin. Studying the Haberlin specimen in the British Museum of Natural History they claim to have found microscopic evidence of hanky panky, and charge that the famous early bird is simply a reptilian fossil decorated with imprints of chicken feathers. Mr. Hoyle refers to the Archaeopteryx as the "Piltdown Chicken". There was no mention in the report of the other specimens of Archaeopteryx also being frauds. I was not aware that any doubt existed in this area. Perhaps it is only of recent times. From all my readings I have gained the impression that Archaeopteryx had been accepted as the first fossil bird. This is the is the first I have read to the contrary.



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