Chinese fossil layers and the uniformitarian re-dating of the Jehol Group

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In recent years the Jehol Group of China has provided evidence of catastrophic burial that contradicts current evolutionary hypotheses. Instead of adjusting the hypotheses to fit the new discoveries, evidence has been forced to fit the prevailing paradigm, sometimes through misleading interpretations and occasionally through apparent fraud. The subjective evidence of feathered dinosaurs is widely promoted by the science media. The Jehol Group was originally dated to the Jurassic. However, it has recently been assigned to the Early Cretaceous despite the known equivocal nature of the biostratigraphic evidence that contains dinosauria from the Triassic to the late Cretaceous.

Character of the Jehol Group

The Early Cretaceous sedimentary layers of the Jehol Group of northeastern China, which includes outcrops in the Liaoning Province, have proved a rich source of fossils with numerous varieties of flora and fauna often found with soft tissue preservation. The Jehol Group consists of the Jiufotang and Yixian formations, which outcrop in southeastern Inner Mongolia, western Liaoning and northern Hebei provinces of China. The Jehol Group strata are extensive with the lower Yixian Formation being 4,700 m at maximum thickness and the higher Jiufotang Formation being a maximum of 1,650 m. Similar layers with comparable biota are found in other parts of eastern and central Asia, including Korea, Japan, Siberia, and as far west as Kazakhstan. A map of the area is shown in figure 1 with table 1 showing a selection of fauna from the different strata together with revised dating.

The conformable layers show an assemblage of terrestrial and freshwater fossils that are more consistent with a terrestrial lake environment as opposed to fluvial, deltaic or open marine environments. The lithology shows finely laminated siliciclastic sediments consisting of sandstones and shales, and layers of extrusive basalt and tuffs.[1] Researchers believe that during deposition there was increased tectonic activity with extensive volcanism along the distant Pacific Rim as evidenced by conformable deposition of tuffaceous sediment within the layers.[2] It is also believed that volcanic activity was more prevalent during the deposition of the lower Yixian strata with decreasing activity exhibited in the overlying Jiofotang strata.[1]

Within the Jehol Group, terrestrial and freshwater organisms are found buried together in the same layers. A large diversity of organic material is well preserved such as insect wings, exoskeletons and plant material, and feathers and fur from birds and mammals, including keratinous beaks and cartilage. The perfect preservation is said to be due to burial in a relatively low energy aqueous setting together with falls of ash that sealed the flora and fauna in quickly. It is envisaged that this provided an anoxic environment that prevented bacterial decay and scavenging by burrowing organisms. However, these conditions, known as *Konservat-Lagerstatten* conditions,[3] provide evidence of catastrophic mass mortality events, especially in the Lujiatun area of western Liaoning Province where three-dimensional preservation of mammals, dinosaurs, lizards and frogs is evident with no obvious bedding plane in the ash tuffs.[4]

While the Jehol Group strata have only become well known within the last decade, popular science writers and the media have given the impression that these layers demonstrate the evolution from theropod dinosaurs to modern birds. A closer examination of the fossils from these layers reveals this reasoning to be deeply flawed. These layers do in fact contain an abundance of modern looking, fully formed bird fossils such as *Confuciusornis sanctus* and *Yanornis martini*, together with perfectly formed theropod dinosaurs such as *Sinosauropteryx prima*. The Liaoning fossil beds and the nature of the sediments do not provide evidence for evolution, but in fact present some powerful challenges to the claims of Darwinists. These amazing fossils are more consistent with the global Flood, involving the rapid burial of a complex ecosystem due to tectonic and volcanic activity.

Confuciusornis sanctus

One of the first bird fossils to be described from the Jehol Group was that of *Confuciusornis sanctus*, which was identified as a beaked bird without teeth. It was initially dated to the Late Jurassic period.[5] Numerous fossils of this bird have subsequently been found suggesting that it flew in flocks, and in many ways this small bird, with clearly identifiable wings, long tail feathers and a toothless beak is similar to modern birds. This particular species of bird has wing claws, which are not unknown in modern birds. For example, the Hoatzin bird of the Orinoco river delta in South America uses claws for climbing. The dating of this bird initially gave it a Late Jurassic age of 135 to 145 Ma, possibly as old as the *Archaeopteryx* bird fossil found in the Solnhofen quarry in 1861. However, such early dating of *Confuciusornis sanctus* presented problems for evolutionists as *Archaeopteryx* is

Table 1. The Jehol Group showing a selection of fauna from the different layers, together with previous and later accepted dates.[4]

Jehol Group	Beds	Selected fauna	Previous dating	New dating
Jiufotang Formation Mainly Shale and tuff Tuffaceous sandstone and tuff Sandstone and conglomerates		*Cathayornis* avifauna *Yanornis martini* *Caudipteryx* species Pterosaur and Sauropod species. (*Microraptor* claimed to be from these layers) *Lycoptera* ichthyofauna.		^{40}Ar–^{39}Ar; 110.59 ± 0.52 Ma Dates given for intrusive Basalt in the Jiufotang Formation from Inner Mongolia.
Yixian Formation Shale and tuff Conglomerate and breccia Tuffaceous sandstone and tuff Sandstones and conglomerate Basalt and andesite towards to lower layers	Jingangshan beds	*Confuciusornis* avifauna/species. *Pterosaur* species. *Psittacosaurus* fauna *Lycoptera* ichthyofauna.	**Yixian Formation** ^{40}K–^{40}Ar; 137 ± 7 Ma ^{87}Rb–^{87}Sr; 143 ± 4 Ma Biotite crystals from a tuff in the Yixian Formation gave dates of ^{40}Ar–^{39}Ar; 145.3 ± 4.4 Ma Combined isochron 147.1; ± 0.18 Ma	
	Dawangzhangzi beds	*Confuciusornis* avifauna/species. *Liaoxiornis delicatus* *Psittacosaurus* fauna *Lycoptera* ichthyofauna. Theropods. *Sinosauropteryx* species		^{235}U–^{207}Pb ;121.1 ± 0.2 Ma from zircons
	Jianshangou beds	*Confuciusornis* avifauna/species. *Lycoptera* ichthyofauna. *Liaoningornis longiditris.* *Psittacosaurus* fauna *Sinosauropteryx prima* & species *Caudipteryx zoui* & species		^{40}Ar–^{39}Ar; 125.0 ± 0.18 Ma tuff layers incremental heating analyes of sanidine and biotite ^{235}U–^{207}Pb; 125.2 ± 0.9 Ma from
	Lujiatun beds	*Sinosauropteryx* species *Psittacosaurus* fauna		^{40}Ar–^{39}Ar; 128.4 ± 0.2 Ma
Tuchengzi Formation at the base of the Jehol group				^{40}Ar–^{39}Ar; 139.4 ± 0.19 Ma

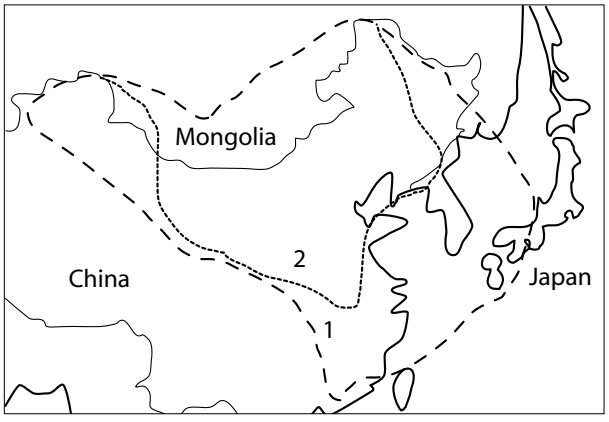

Figure 1. Map showing the area of coverage of the Jehol Group. (1) The higher Jiufotang Formation is marked with a dashed line. (2) The lower Yixian Formation is marked with a dotted line. The circle marks that area of major vertebrate fossil finds in Liaoning Province. (After Zhou *et al*.[4]).

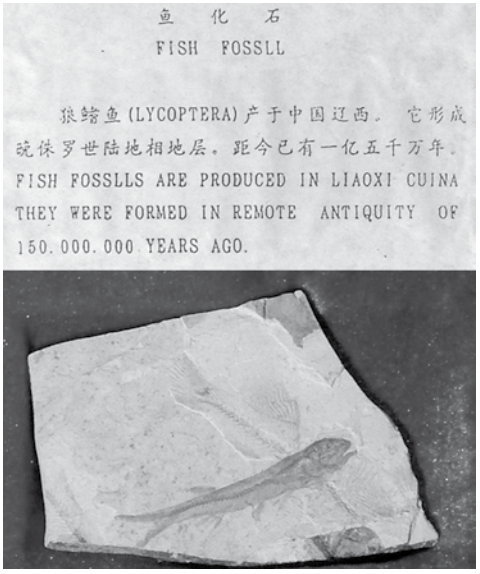

Figure 2. Photograph of small fish *Lycoptera* found in Liaoxi area of Liaoning Province China showing a Jurassic date of 150 Ma. These layers were subsequently reassigned to the Early Cretaceous. The evidence remains equivocal, with fauna from both the Triassic and upper Cretaceous present in the Jehol Group.

widely considered to be the best evidence of a transitional dinosaur to bird form.

Finding *Confuciusornis sanctus* and other birds as fully-formed, modern-looking varieties in the Late Jurassic layers presented a serious challenge to the view that *Archaeopteryx* should be identified as a transitional form. Strata within the Jehol Group also contain placental mammals and angiosperm plants, which suggested that the prevailing evolutionary theory would have to be radically changed to fit a Late Jurassic age for these layers. For this reason it was considered necessary to adjust the age of these Late Jurassic layers forward to the Early Cretaceous instead of revising the evolutionary concept in light of new evidence from China. Other evidence of suspect origin and quality was also accepted to support the prevailing 'dinosaur to bird' evolutionary hypothesis against the fresh evidence that was accumulating from the Jehol Group strata.

Sinosauropteryx prima

The first dinosaur used to claim evidence for bird evolution was *Sinosauropteryx prima*. It is a small theropod dinosaur, but with the appearance of a line of 'proto-feathers' along the spine of the animal.[6] These purported fibres along the animal's back encouraged the researchers to wrongly name it as the 'first-Chinese-*winged*-reptile'. However, in just about all other respects this animal found in the Liaoning strata is almost identical to the Late Jurassic *Compsognathus* found in the Solnhofen quarries of Germany. Later studies have shown that the line of 'proto-feathers' is in fact collagen fibre, often aptly named *dino-fuzz*. It is possible that these fibres existed beneath the skin.

Further evidence shows that *Sinosauropteryx prima* had a pelvis and lung physiology typical of other theropod dinosaurs, and with close similarities to the present day crocodile.[7] Crocodiles and alligators have diaphragm muscles that attach from the pubic bone, these extending forward to the rear part of the liver with the diaphragm directly in contact with the liver. The piston like movement of the diaphragm muscles causes the septate reptile lungs to inflate and deflate in typical bellows-like action. Birds are markedly different, with suprapubic muscles attached from the rearward extending pubic bone to the base of the tail. These muscles pull down the tail, causing the pelvic bone to rotate and lift the spine in front of the pelvis. This draws air into the rear air sacs with subsequent unidirectional flow of air through the lung system. This unidirectional flow is instead of the bellows like lung system of reptiles, and whereas reptile septate lungs consist of large chambers and are relatively inefficient, birds have thousands of tiny highly vascular septae or faveoli. Both reptile and bird lungs appear perfectly designed although markedly different, being designed for different environments.

Bearing in mind the critical nature of the lung system together with functionality being systemically integrated with the bone and muscle structure, it is quite clear that one could not evolve from the other. Ruben for instance notes that any transitional form would have suffered a hernia,[7] and both seem irreducibly complex. *Sinosauropteryx prima* can be shown to be typical of other theropod dinosaurs known throughout the world from the fossil record, as well as sharing physiology with still living crocodilian reptiles.

Archaeoraptor fraud and *Microraptor gui*

A few years later a rather strange fossil creature appeared in the world of palaeontology. *Archaeoraptor* was announced in *National Geographic* as a four-winged reptile with the appearance of feathers.[8] This fossil was claimed to have both bird and dinosaur features with visible impressions of feathers. The fossil later turned out to be fraudulent, consisting of at least two and possibly five separate fossils.[9] The Chinese researcher Dr Xu Xing identified the front half of the fossil as a fish eating bird named *Yanornis martini,* again having close similarities to some modern birds. The rear part was found to fit perfectly as a mirror image to the fossil of a reptile found in a private collection in China. This tail was subsequently stated as belonging to *Microraptor zhorianus*.[10] The artistic imagery that was provided alongside the fossils had all the appearance of Chinese Dragon, and interestingly, is surprisingly similar to a drawing of the hypothetical early bird *Proavis* drawn by the artist Gerhard Heilman in 1926.

Some time after the *Archaeoraptor* debacle, *Microraptor gui* was presented to the world in a *Nature* article. The lead author of the *Nature* paper was Dr Xu Xing who uncovered the *Archaeoraptor* fraud, and later identified the tail part of *Archaeoraptor* as *Microraptor zhorianus*.[11] *Microraptor gui* was again depicted as a four-winged dinosaur that used flight feathers for gliding. Jonathan Sarfati, in his critique of the paper, pointed out that five of six specimens presented in the *Nature* paper with apparent feathers, were bought from dealers in the same area of Liaoning province where the *Archaeoraptor* fake was made and purchased.[12] This raised serious doubts about the bird fossil finds. Sarfati notes that the one fossil found by the researchers in the field (IVPP V13476) from Liaoning Province had nothing on it that could be positively identified as feathers.[12] The more likely scenario is that the impressions are no more than collagen fibres. The researchers also admitted that some of the pieces of rock from the purchased fossils had been glued together improperly.

It should be noted that not all palaeontologists have accepted the evidence for dinosaur-to-bird evolution found in Liaoning Province. Such sceptics are committed to the Birds Are Not Dinosaurs (BAND) evolutionary hypothesis. One dissenting evolutionist from the BAND group is Alan Feduccia, who commented that the *Archaeoraptor* fraud was the tip of the iceberg. Feduccia noted that there are scores of fake fossils in existence, which has cast a shadow over the field of palaeontology, making it very hard even for the experts to tell the real specimens from the fake. He also commented on rumours that there exists a 'fake-fossil factory' in Liaoning Province, northeast China, near to where the fake fossils were allegedly uncovered.[13] Feduccia also points out that *Caudipteryx zoui* and *Protarchaeopteryx robusta*, which show feathers, should really be classified as flightless birds and not as *Coelurosaur* dinosaurs.[14]

Another leading scientist, Storrs Olsen, who is a Curator of Birds at the Smithsonian Institute, National Museum of Natural History, commented that the fabrication of evidence in support of the dinosaur-to-bird hypothesis is in effect one of the 'grander scientific hoaxes of our age'.[15] He noted that there exist a group of zealous scientists who are acting together with some editors at *Nature* and *National Geographic*. According to Olsen, some members of this group have become highly biased promoters of the dinosaur-to-bird evolutionary hypothesis and are not shy in speaking out. This has led to the careful scientific weighing of evidence and truth to become casualties as a result of this programme.[15] The age of the *Microraptor gui* fossils is at odds with, and therefore inconsistent with, current evolutionary theory as the claimed fossil evidence is stated as being from the higher Jiufotang Formation, whereas both *Sinosauropteryx prima* and *Confuciusornis sanctus* are found in the lower Yixian Formation. This contradiction has not been resolved despite the re-dating of the Jehol Group as discussed below.

Equivocal radiometric dating of the Yixian and Jiufotang formations

Disagreement exists over the dating of the Jehol Group in Liaoning Province. Different techniques have given varying dates, but the earlier consensus for the Yixian and Jiufotang formations was for a Late Jurassic period with the Jurassic-Cretaceous boundary initially placed about 135 Ma. However, the date of this boundary is not universally accepted with many geologists favouring an age of around 144 Ma. Not only has the Jurassic-Cretaceous boundary been revised to an earlier date, but the Jehol strata have subsequently been revised to a later period as well. The earlier radiometric dating methods for this region gave a Late Jurassic age, which was in agreement with the prevailing biostratigraphic evidence that was broadly accepted at the time. Typical dates determined from the lower Yixian Formation were given as:[4] ^{40}K–^{40}Ar: 137 ± 7 Ma, and ^{87}Rb–^{87}Sr: 143 ± 4 Ma. Biotite crystals from a tuff in the Yixian Formation gave dates of: ^{40}Ar–^{39}Ar: 145.3 ± 4.4 Ma and the combined isochron: 147.1 ± 0.18 Ma.

However, this dating was subject to revision in 1999 (table 1).[4] The first two dates still fit within the revised Early Cretaceous boundary and are acceptable to evolutionary scientists. However, the last two methods are now considered suspect because they say the samples used may have contained trapped argon or were altered diagenetically. Argon is an inert gas and can migrate through rock layers, therefore escaping faster from some rock types than others. There is in fact no way of assessing, after the event, which rock samples contained the correct amount of argon for radiometric dating purposes. There are of course other problems with radiometric dating, and the ICR/CRS RATE team have also provided further evidence that radiometric dating methods are unreliable with regard to the way in which inert helium migrates through zircons.[16]

The later revised dating assessments for Liaoning Province provided dates that are consistent with an Early Cretaceous time frame:[4] ^{40}Ar–^{39}Ar: 124.6 ± 0.1 Ma, ^{40}Ar–^{39}Ar: 125.0 ± 0.18 Ma (total heating and incremental heating analysis of sanidine and biotite crystals in the Jianshangou beds); ^{40}Ar–^{39}Ar: 128.4 ± 0.2 Ma basalt capping the Lujiatun beds; ^{235}U–^{207}Pb: 125.2 ± 0.9 Ma from zircons in Jianshangou beds; and ^{235}U–^{207}Pb: 121.1 ± 0.2 Ma from zircons overlying lava in Jianshangou beds. A date for the Tuchengzi Formation at the base of the Jehol Group was reported as: ^{40}Ar–^{39}Ar: 139.4 ± 0.19 Ma. The intrusive Basalt in the Jiufotang Formation from Inner Mongolia gave an age approximation of: ^{40}Ar–^{39}Ar: 110.59 ± 0.52 Ma.

Equivocal biostratigraphical dating

The other method used in dating these layers is biostratigraphic correlation. It involves comparison of animal and plant fossils found in different sedimentary formations. This work is highly subjective, with some objections and disagreements raised by uniformitarian palaeontologists over the equivocal nature of the process. For instance, some taxa are considered to have poor stratigraphic resolution, other taxa are difficult to diagnose or differentiate, while other objections are that some vertebrates have limited biostratigraphic utility.[17,18]

Close examination shows that the Jehol Group strata contain taxa from the Late Triassic layers, through the Mid-Jurassic, to the Late Cretaceous. Some of the taxa, which extend across much of the Mesozoic, include the Jurassic pterosaur *Dendrorhynchoides* and a Tritylodontid synapsid normally known from the Triassic to Mid-Jurassic period, which is found in Early Cretaceous strata of Japan.[4] Another animal that appears in the Jehol Group is *Sinosauropteryx prima*, an almost identical theropod to the Late Jurassic *Compsognathus* found in the Solnhofen quarries of Germany. Other animals that have been found in the Jehol Group are more typically associated with the Late Cretaceous, such as tyrannosaurs and oviraptor theropods, titanosauriform, dromaeosaurid and iguanodontian dinosaurs.[4] Biostratigraphic analysis of the Jehol Group has therefore provided equivocal evidence with the layers of East Asia now stated as being Early Cretaceous instead of the previous identification as Jurassic. Figure 2 for instance shows the fossil of a small fish *Lycoptera* found in Liaoxi area of Liaoning Province, China, prior to 1998 with assignment then to the Jurassic period.

Palaeontologists struggle to account for such diversity of animals and plants that are found in one region, and such conflicting evidence is contrary to existing theories of evolutionary progression. The reason given for such diversity is that isolation allowed relic species to survive, and then once isolation was breached, the region became a centre for diversification and colonisation by cosmopolitan species. More likely it demonstrates that such strict classification of layers into separate ages is incorrect and that all the strata were deposited in rapid succession. More recently a beaver like mammal *Castorocauda lutrasimilis*[19] has been identified from the Jurassic Jiulongshan Formation of Inner Mongolia,

with stated age of around 164 Ma, again presenting a serious challenge to the established evolutionary biostratigraphical evidence.

Conclusions

Radiometric dating is inconsistent with equivocal biostratigraphic evidence used in establishing a defensible age for the materials found in the Jehol Group. There is circularity in this reasoning with the acceptable evolutionary hypothesis determining how the observational evidence is interpreted. Such evidence is then used to support the desired hypothesis. It is hard to avoid the conclusion that the reassignment of the Jehol Group to the Early Cretaceous was considered necessary because modern birds and placental mammals cannot occur in the Jurassic. Modern birds occurring with similar ages to *Archaeopteryx* would cause serious problems for evolutionists where dinosaur-to-bird evolution has become a major pillar of evolution. If the Jurassic age for the Jehol Group was acceptable to uniformitarian palaeontologists then modern birds would occur at the same time as the dinosaurs from which they are thought to have evolved, thus completely negating the evolutionary idea that dinosaurs evolved to modern birds. Morphological comparisons between the Early Cretaceous *Sinosauropteryx prima* indicate that it is an almost identical reptilian animal to the Late Jurassic *Compsognathus*.

Not only have dates been revised to overcome problems with recent discoveries, but forced and fraudulent evidence has been widely publicised by leading science journals to give the impression that the Jehol Group strata are full of transitional dinosaur-to-bird fossils. As a result, this has now entered the popular imagination in spite of the fact that the real evidence tells a different story. Even some evolutionists, those committed to the BAND hypothesis, have recognised that this is no more than a grand scientific hoax. The truth is that theropods and birds appear fully formed in these layers, and are buried together with fauna that extend from the Triassic to the Late Cretaceous. Claimed transitional forms have also been shown to be fraudulent.

Layers in the Jiufotang and Yixian formations consist of sandstone and conglomerates, together with interspersed volcanic ash tuff deposits and basalt, with animals and plants buried rapidly. All of this is consistent with the global Flood involving tectonic and volcanic activity wiping out a single ecosystem. All of this evidence in the Jehol Group is consistent with the Noahic Flood, and it runs counter to the prevailing evolutionary hypotheses.

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