

## A REVIEW OF CLAIMS ABOUT *ARCHAEOPTERYX* IN THE LIGHT OF THE EVIDENCE

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### Abstract

*Archaeopteryx has widely been claimed to be the outstanding piece of evidence for macro-evolution in general and for evolution from reptiles to birds in particular. But while it is the oldest known bird and also an interesting mosaic containing some features also found in reptiles, there is neither evidence of a lineage from reptiles to Archaeopteryx nor from it to any living birds. Further, and also most importantly, natural selection is inadequate as a possible mechanism to explain the descent of Archaeopteryx. In view of the evidence, science has oversold the case for Archaeopteryx as a transitional form.*

Strong claims are frequently being made in scientific journals, textbooks, and the secular press about “the fact of evolution.” On the other hand, Johnson (1991) and others argue that, while micro-evolution within a species does occur, real evidence for macro-evolution does not exist, notwithstanding repeated claims to the contrary. Also, authors like Goldsmith (1990) find Neo-Darwinism unsatisfactory in its explanatory power and criticize the reductionistic and mechanistic paradigm of science.

Whether evolution is a theory or whether it is a scientifically established fact depends, or should depend, to a significant extent upon the existence of fossils that would support the claimed evolution, be it gradual or be it punctuated by evolutionary spurts. The main focus of this study is on evolutionist and creationist interpretations of one important fossil—that of *Archaeopteryx*—that have been made over time. Evolutionists have claimed for over a century that remains of a “reptile-bird” named *Archaeopteryx* were the best evidence for a transitional form and thus for macro-evolution. Wesson (1992, p. 38), for example, highlighted the exceptional importance given to *Archaeopteryx* by evolutionists and correctly put it into the broader context of a fossil record that does not seem to support Darwin’s theory by stating that

[Darwin] was much concerned with the incompleteness of the fossil record. He attributed it to the accidental absence or erasure of parts of the record and the inadequacy of exploration, and he was confident that in time the gaps would be filled. This was not implausible in his day. But since then the hundredfold multiplication of the number of known fossils has not much improved the continuity of the record. The most impressive intermediate—the reptile-bird *Archaeopteryx*, the most famous of all fossils—was aptly discovered in 1861 when debate over the new theory was most heated, encouraging the hope that more digging would uncover many more such discoveries. But no equally admirable bridging form has been found.

As we will see below, even this “bridging form” looks much more like a lone obelisk than a connection between two sides of a gulf.

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### Wide-spread Claims About *Archaeopteryx* Over Time

For over 130 years, *Archaeopteryx* has been presented by many evolutionists as the outstanding piece of fossil evidence for a transitional form between reptiles and birds and that it therefore provided empirical support for the theory of evolution. Proponents of the theory of evolution have shown little or no restraint or used no caveats when writing about *Archaeopteryx*. Wellnhofer (1990, p. 70) stated that

*Archaeopteryx* provides paleontologists with their most conclusive evidence for the evolution of birds from reptiles. . . . Its combination of anatomical characteristics from two distinct classes of animals make [it] the oldest known bird, a textbook example of a transitional form between reptiles and modern birds. *Archaeopteryx* is a perfect example of a transitional form in the evolution of modern birds from reptiles.

Other examples of statements on *Archaeopteryx*, spanning a large part of this century, include the following. Thomson (1925, p. 58) referred to the

thrill it must have been in the world of naturalists when *Archaeopteryx* was discovered in Jurassic strata in Bavaria—an extinct bird linking the creatures of the air back to the reptiles of the earth.

Beadnall (1934, p. 112) wrote that “[*Archaeopteryx*] was, in fact, a link in the evolutionary chain, a creature that had been a reptile but was not yet bird—a true reptile-bird.” Carter (1954, p. 46) said that *Archaeopteryx* is a fossil “truly intermediate between birds and reptiles.” Mayr (1976) refers to *Archaeopteryx* as “a virtually perfect intermediate between birds and reptiles.” Ruse (1976, p. 14) mentions *Archaeopteryx* as “the bird/reptile” and as the best known bridging fossil between major classes of organisms supporting “the fact of evolution.” Grasse (1977, p. 74) refers to the outstanding evidence of *Archaeopteryx*, “which exhibits a real mixture of reptilian and bird-like characters.” Gould (1977, p. 187) refers to *Archaeopteryx* as an intermediate form between cold- and warm-blooded vertebrates. Leakey (1979, p. 15) mentioned that the finding of *Archaeopteryx* in 1861 was “a triumph for Darwin.” Futuyma (1986, p. 38) refers to *Archaeopteryx* as an “exquisite intermediate between birds and reptiles.” Reichhoff (1992, pp. 89-90) praises *Archaeopteryx* as demonstrating “the way of evolution,” and that, when it was discovered, “the euphoria was understandable, a place in all textbooks assured.”

To conclude this sample of statements over time, one needs to refer to the International *Archaeopteryx* Conference held in Eichstatt, Germany, in 1984, and the proceedings published by Hecht et al. (1985). The conference brought together many of the top researchers in the field. Pros and cons of many issues were freely discussed, and there were some disagreements on some matters (and since that time, some of the hypotheses had to be revised or abandoned because of new evidence such as the work by Feduccia, 1993). However, conferees did unanimously agree to the declaration that: "Organic evolution is a fundamental process of biology and we recognize the importance of the *Archaeopteryx* contribution to that problem" (Preface, in Hecht et al., 1985; complete statement bold-faced in original). Expressing strong allegiance to evolutionary doctrine does not necessarily mean, as many papers in the volume show, that the individual contributions addressing various narrowly focused, specific issues are biased. But some authors show little restraint; Hecht (1985, p. 149), for example, in the abstract of his paper, says that ". . . the discovery of *Archaeopteryx* is presented as historical evidence for the Darwinian theory of evolution." The problem is that working with only one pre-analytic vision, at the exclusion of any other, must lead to biases at a more general level, as shown in this article by comparing claims with the evidence.

#### The Evidence:

##### *Archaeopteryx* Is A Bird with Peculiarities

Feduccia (1993) measured the curvature of the foot claws of the three best *Archaeopteryx* specimens and compared them with 500 species of existing birds. He concluded that "One can infer from the claw-arc measurements of the pes of *Archaeopteryx* that it was a perching bird" (p. 793). Further evidence suggests that *Archaeopteryx* had an advanced aerodynamic morphology, for which Feduccia lists nine documented facts. He therefore concluded unequivocally that: "*Archaeopteryx* was arboreal and volant, considerably advanced aerodynamically, and probably capable of flapping, powered flight to at least some degree. *Archaeopteryx* probably cannot tell us much about the early origins of feathers and flight in true protobirds because *Archaeopteryx* was, in the modern sense, a bird" (p. 793). That Feduccia is working from the perspective of the evolution model comes through when he refers to feathers including their microstructure as being "unchanged in structural detail over 150 million years of evolution." It seems contradictory using the term evolution and applying it to a feature with no change whatsoever for over 150 million years.

While Feduccia's findings were much publicized, they represented no surprise to some paleontologists and to most creationists. The thoroughness and comprehensiveness of his work, however, confirmed what has been argued previously based on the analysis of the available evidence. For example Owen (1863) 130 years earlier did an extremely thorough analysis of the London specimen of *Archaeopteryx* that was published along with four beautifully drawn plates. He concluded: "The best determinable parts of its preserved structure declare it unequivocally to be a Bird, with rare peculiarities indicative of a distinct order in the class" (p. 46).

There have been others, particularly creationists but also evolutionists, who have classified *Archaeopteryx* as a bird. Olson (1965, p. 182), an evolutionist and geologist, concluded that, because of the possession of feathers, "[*Archaeopteryx*] shows itself to be a bird." Gish (1973, p. 60), partly basing his conclusions on that of Olson and others, states: "[*Archaeopteryx*] is not intermediate at all because, as paleontologists acknowledge, *Archaeopteryx* was a true bird—it had wings, it was completely feathered, it flew. It was not a half-way bird, it was a bird." Martin (1985, p. 182) concluded that "*Archaeopteryx* is a genuine bird," and Ostrom (1985) also wrote: "There can be no doubt that *Archaeopteryx* was a true bird." Brown (1987, p. 78) refuted in some detail arguments about *Archaeopteryx* being an intermediate. He concludes that "much more of the anatomy of *Archaeopteryx* could be discussed, but there is surely enough presented here to show that the creature was a true bird and not some kind of intermediate stage between reptiles and birds." Junker and Scherer (1992, p. 199) also state that *Archaeopteryx* was surely a bird because of feathers that are identical to those of modern birds.

Because of peculiarities of *Archaeopteryx*, some evolutionists such as Gould and Eldridge have used the term "mosaic" for it, because it has some features that are similar in morphology to those of reptiles. In their 1977 article (p. 147) they state that: "At the higher level of evolutionary transition between basic morphological designs, gradualism has always been in trouble, though it remains the 'official' position of most Western evolutionists. Smooth intermediates between Bauplaene are almost impossible to construct, even in thought experiments: there is certainly no evidence for them in the fossil record (curious mosaics like *Archaeopteryx* do not count)."

##### *Archaeopteryx* as Seen from the Perspective of the Evolution Model

The evolution model predicts that birds have evolved either directly from dinosaurs or from crocodile-like creatures that were the ancestors of both the dinosaurs and the birds. For such a significant transformation to happen there would have had to be millions and millions of intermediates. As Darwin wrote: ". . . the number of intermediate varieties, which have formerly existed, must be truly enormous (Darwin, 1967, p. 292). Darwin's explanation for the lack of transitional fossils at his time was the imperfection of the geological record. But if it was a valid argument at that time, this is no longer the case. As Gish (1993, p. 111-12) stated

In the natural history museums of the world are to be found more than 250,000 different fossil species, represented by tens of millions of catalogued fossils. These have been taken from every one of the so-called geological periods. Thus, the fossil record is almost immeasurably rich. An appeal to the "poverty of the fossil record" is no longer available.

Thus, if macro-evolution was an empirical fact rather than just a theory, there should be many true transitional forms in evidence in the fossil record.

To qualify as a true intermediate between reptiles and birds in support of macro-evolution, one would

ideally wish to prove that some class of reptiles or other creatures were actually the ancestors of *Archaeopteryx*. But such proofs are near impossible to find. In their absence, one would wish to be able to show, as an evolutionist, that the morphological characteristics of *Archaeopteryx* represent modifications, by natural selection, of characteristics found in reptiles.

Views on who the ancestors of *Archaeopteryx* have changed over time. The prevailing view during the last two decades or so has been that it descended from small running dinosaurs known as coelurosaurian theropods. In the words of Padian (1989, p. 202)

the study of the origin of birds and their flight underwent a renaissance in the 1970s and 1980s spurred largely by John Ostrom's demonstration that they evolved from small carnivorous dinosaurs.

Ostrom's views were summarized, for example, in his paper given at the *Archaeopteryx* conference where he stated that

the five known specimens of *Archaeopteryx* preserve the only solid physical evidence of the earliest recognizable stage of bird evolution and thereby provide the most compelling evidence about bird origins—which all point to a coelurosaurian ancestry—not crocodylian and not thecondontian (Ostrom, 1985, p. 174).

But there are significant differences between *Archaeopteryx* and (coelurosaurian theropods. (a) *Archaeopteryx* had feathers that are identical to those of modern birds, whereas theropods had none. (b) *Archaeopteryx* had a hypertrophied furcula (fused clavicles); theropods do not have one. (c) Manus claws of *Archaeopteryx* differ markedly from those of predatory dinosaurs (Feduccia, 1993). (d) *Archaeopteryx* had a fully reversed hallux, the large rear toe, with a strongly curved claw on the ungual phalanx, which is typical of modern perching birds and unlike any known theropod dinosaur (Feduccia, 1993). (e) *Archaeopteryx* had teeth, which is among the reasons why *Archaeopteryx* has been connected to reptiles. But the crowns of *Archaeopteryx*'s teeth were unserrated, the waist present, the root expanded, and the tooth replacement resorption pit oval to circular. On the other hand, in the reptiles *Pseudosuchia* and Coelurosauria, the crowns were serrated, the waist absent, the root straight and unexpanded and tooth replacement resorption pit elongate (Brown 1987, p. 78).

Not only are there problems in linking *Archaeopteryx* to theropods, there is no link from it to any modern birds. Martin (1985, p. 182) states: "*Archaeopteryx* is not ancestral to any group of modern birds. It has specializations in its tarsometatarsus and skull which show conclusively that it is on a side branch of avian evolution." Since this is so, where then, one may ask, are the alleged intermediates lying on the main branch?

To use an interesting fossil as evidence for macro-evolution, should one not have a reasonable, detailed explanation on how it could have evolved, tiny step by tiny step, by the mechanism of natural selection and from which ancestors? But how, for example, could scales become feathers and not only be useful in the intermediate stages but provide a comparative advantage? Further, as pointed out by Gould and Eldridge (1977, p. 147), and I believe it is applicable for this

case: "Smooth intermediates between Bauplaene are almost impossible to construct, even in thought experiments."

If gradualism cannot provide the answers, the only other mechanism would be saltations, but this moves us outside the sciences and into the realm of creative miracles. And without proven or even imagined *mechanism* for a possible reptile to *Archaeopteryx* lineage, one should not accept *Archaeopteryx* as evidence for macro-evolution from reptiles to birds.

Since Darwin proposed his theory, large investments in terms of human and financial resources have gone into research to substantiate the evolution model. Scientific research on the development of the creation model has been marginal at best. So it is not surprising that considerable opportunities for the development of the creation model remain.

### Concluding Comments

Given the claims that have been made for over a century that *Archaeopteryx* presents evidence for macro-evolution between reptiles and birds, questions emerge from this case study concerning the accuracy of these claims. As stated by Johnson (1991), such science appears to be far more a platform to advance a belief in scientific naturalism than true science. This case study further supports and illustrates Johnson's findings.

Interesting in the context of this note is also a statement by Raup (1983, p. 156) that

we actually may have fewer examples of smooth transitions than we had in Darwin's time, because some of the old examples have turned out to be invalid when studied in more detail,

and that was written for a publication that was to refute creationism! If, after over a century of searching, *Archaeopteryx* is the best piece of evidence for macro-evolution, as many evolutionary texts have claimed it to be, this suggests that the theory lacks the support it would need to be a proven scientific theory. The repetition of unqualified and unsubstantiated claims also raises the question of how self correcting the science of origins is.

From the beginning, an anti-Creator philosophy was at the root of Darwinism and in fact was the element that held the various views of the movement together. In the words of Mayr (1991, p. 99):

There is indeed one belief that all true original Darwinians held in common, and that was their rejection of creationism. . . . That was the flag around which they assembled and under which they marched.

Further,

the conviction that the diversity of the natural world was the result of natural processes and not the work of God was the idea that brought all so-called Darwinians together in spite of their disagreements on other of Darwin's theories . . .

According to Darwinism, natural selection (in combination with mutation) is an innovative evolutionary process capable not only of producing new kinds of organs but even new phyla. Rather than going to empirical evidence to test a doubtful theory, many scientists have approached this matter by uncritically look-

ing for confirmation for the only theory that they were willing to tolerate. As for the case of *Archaeopteryx*, claims of evidence should therefore be taken with caution, carefully reviewed, and not trusted without objective verification.

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#### Editor's Note

Readers will discover two other CRSQ articles on *Archaeopteryx*: Calais, R. and G. Duffett. 1988. A theory for the birds. *CRSQ* 24:183-185. Calais, R. 1989. Response to Padian. *CRSQ* 25:202-207.

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## LETTERS TO THE EDITOR

### Criticisms of The Universal Flood Based on Unknowns: A Reply to Mr. Yake

Bill Yake's letter is interesting because the letter introduces objections from friends and critics to a universal Flood. Mr. Yake willingly sides with the skeptics in an apparent effort to get at the truth, which is admirable, though not necessarily productive.

The objections proposed in Yake's letter are not directed at the premise that there was a universal Flood. Rather the objections are directed at explanations offered by those who believe in a world-wide Flood. Defeating those explanations does not necessarily allow for a conclusion that the Flood was not universal, because explanations can be finer-tuned or even discarded and replaced while one continues to support the one and only universal Flood.

Mr. Yake is correct in suggesting that perhaps there are no right or wrong answers. I know of no university that offers a PhD in Omniscience, sub-standard though

that major would be when contrasted with the omniscience of God. Consequently any scientific explanation by evolutionist or creationist is generally limited to that scientist's knowledge (and biases and deficiencies) within his particular profession. There is therefore one source of truth. It is the Bible and Mr. Yake's citation of 2 Peter 3:5 suggests agreement. Everything else is scientific babel, except that babel is a healthful grist for one's own scientific mill. How else would we hone our scientific minds and learn if varieties of explanations were not offered?

If Genesis 6:7 informs that a unique Flood wiped man, animals, creeping things and birds from the face of the earth, then there should be field evidence for a unique Flood that could have destroyed man, beast, reptiles and birds. The uniqueness of the biblical Flood suggests universality. Genesis 7:19,20 indicates that the unique Flood covered the mountains. Further, God promised in Genesis 9:11 that He would never send another Flood capable of destroying earth and all that