

## ARCHAEOPTERYX, ARCHAEORAPTOR, AND THE “DINOSAURS-TO-BIRDS” THEORY—[PART I]

**Brad Harrub, Ph.D. and Bert Thompson, Ph.D.**

[EDITOR'S NOTE: Coauthoring this month's article with me is our new Director of Scientific Information, Dr. Brad Harrub, who has just joined us as of this month. Please see my “Note from the Editor” on the back page for an introduction to this talented young man.]

Evolutionary scientists would have us believe that dinosaurs actually still exist on Earth. In fact, these same scientists will provide testimonials about the presence of these modern-day dinosaurs in your very own backyard! But don't worry. These dinosaurs are not scaly reptilian creatures with long, sharp teeth that stand ready to devour your family pet. These modern-day “dinosaurs” weigh only a few ounces and are quite harmless. In fact, there may be 10-20 gathered around your bird feeder even as you read this paragraph.

“Birds are dinosaurs!” This is the provocative beginning to the chapter on the origin of birds in a 1996 book, *The Evolution and Extinction of the Dinosaurs*, by D.E. Fastovsky and D.B. Weishampel. The notion that birds evolved from dinosaurs has become the dominant evolutionary theory since its introduction over 20 years ago by John Ostrom of Yale University, one of the world's leading authorities on the origin of birds (see Ostrom, 1975, 1976, 1991). The results of his dogged persistence in promoting this theory can be seen in most textbooks of vertebrate zoology today. Granted, the idea of dinosaurs evolving into birds, if true, would help explain one of the most serious problems facing evolutionists today—the origin of birds.

The key words here, of course, are “if true.” Actually, the theory leaves evolutionists with the problem of explaining just how those early reptiles got off the ground and into the air—and then stayed there!

Most evolutionists today contend that the scales of ancient dinosaurs evolved over millions of years into the feathers of modern-day birds, but no fossil evidence exists for this type of transformation. Considering the complex embryonic origin and subsequent development of feathers, this hardly is surprising. Scales are flat horny plates. Feathers, on the other hand, are very intricate in structure, consisting of a central shaft from which radiate barbs and barbules. The barbules are equipped with tiny hooks that lock onto the barbs and bind the feather surface into a flat, strong, flexible vane. Also, we now know that feathers and scales arise from different layers of the skin. Furthermore, the development of a feather is not only a complicated process, but also is fundamentally different from that of a scale—in that feathers, like hairs, develop from follicles. A hair, however, turns out to be a much simpler structure than a feather. The developing feather is protected by a sheath, and forms around a bloody, conical, inductive dermal core. The developing feather not only is sandwiched between the sheath and dermal core, but also is quite complex in its design. Development of the cells that eventually will become the mature feather involves several complicated physiological processes. Cells form, then migrate and split apart in highly specific patterns to form

the complex arrangement of barbs and barbules (see Lucas and Slettenhein, 1972). And so, without a true intermediate form at which to point, biologists are left on their own to invent speculative and imaginative theories about how “lizard-size” dinosaurs ever got off the ground. One cannot help but be reminded of the comments of evolutionist Richard Dickerson, writing in a special issue of *Scientific American* some years ago on the topic of the spontaneous generation of living organisms from nonliving antecedents. After noting that there was little to no actual evidence for anything of the sort, he indicated that this was not necessarily bad since it left one free to “speculate endlessly, unfettered by inconvenient facts” (1978, 239 [3]:85). The same might be said today of the dinosaur-to-bird theories of evolutionists.

Over forty years ago, in the chapter he authored on “The Origin of Birds” for the book, *Biology and Comparative Physiology of Birds*, evolutionist W.E. Swinton lamented: “The origin of birds is largely a matter of deduction. There is no fossil evidence of the stages through which the remarkable change from reptile to bird was achieved” (1960, 1:1). Very little has changed in the four decades since Swinton's statement, as we will show in this article. In fact, the lack of fossil support for evolution has been a thorn in the side of evolutionists since the time of Charles Darwin, who wrote in *The Origin of Species*:

...[T]he number of intermediate varieties which have formerly existed [must] be truly enormous. Why then is not

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### Editor:

Bert Thompson, Ph.D.\*  
(\*Microbiology, Texas A&M University)

### Associate Editor

Brad Harrub, Ph.D.\*  
(\*Neurobiology, University of Tennessee)

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every geological formation and every stratum full of such intermediate links? Geology assuredly does not reveal any such finely graduated organic chain; and this, perhaps, is the most obvious and gravest objection which can be urged against the theory (1859, p. 292).

Although a strong advocate of evolution, Darwin nevertheless recognized the lack of true intermediates in the fossil record, as well as the impact their absence had on that concept. Once again—but this time more than a century later—very little has changed, as Harvard’s eminent paleontologist (and indefatigable crusader for evolution) Stephen Jay Gould repeatedly has made clear in his voluminous writings.

The absence of fossil evidence for intermediary stages between major transitions in organic design, indeed our inability, even in our imagination, to construct functional intermediates in many cases, has been a persistent and nagging problem for gradualistic accounts of evolution (1980, 6[1]:127).

Gould has no trouble admitting that the lack of true “intermediates” still is a prevalent feature in the record of the rocks. Three years earlier he had written, in fact:

The fossil record with its abrupt transitions offers no support for gradual change. All paleontologists know that the fossil record contains precious little in the way of intermediate forms; transitions between major groups are characteristically abrupt (1977, 86:22,24).

And so, without any foundation of intermediate species to substantiate their theory, evolutionists are left merely to **imagine** how those first land animals ever could have taken flight.

Two major theories for the evolution of flight exist today. First, there is the cursorial theory (also called the “ground-up” theory) in which small animals trying to capture insects with their forelimbs occasionally would leap up into the air after them. John Ostrom speculated that the front limbs of the first fossilized birds became specialized to allow the creatures to glide through the air in order to trap insects (1974, 1976, 1979). In 1982, the British Museum of Natural History in London included Ostrom’s “insect-catching” explanation in its display on the origin of birds. However, this particular theory does not explain how the **insects** got off the ground in

the first place. Were they “leaping” after something, too? Evolutionists have an equally difficult time describing the separate and complex evolution of insect flight.

The second theory is the arboreal or “tree-down” theory, in which animals that had climbed into the trees suddenly had to jump down to evade predators (Eaton, 1984, pp. 1-11; Bennett, 1997). This theory postulates that eventually these jumping animals evolved wings in an effort to better escape predators. [We suppose it would have been much too difficult for these tree-climbing animals simply to find a safer environment.] No matter whether you examine the problem via the “ground-up” theory or the “tree-down” theory, it was imperative that evolutionists uncover **some** type of intermediate species so they could weave birds into the composition of their evolutionary tree.

## A MATTER OF PERFECT TIMING

**A**ccording to evolutionists, toward the end of the Jurassic period (allegedly 155 million years ago) a warm, shallow sea studied with small islands covered much of what is known today as southern Germany. Encircling these islands were warm, isolated lagoons that exhibited increased salinity and that probably were anoxic (depleted of oxygen). Thus, scientists have speculated that there were no scavengers present to eat whatever creatures happened to die and be washed into the lagoons. That, they believe, made this climate ideal for the preservation of fully intact bodies in the soft carbonate mud. This carbonate mud then reportedly formed a fine-grained, flat, cleaving limestone known today as the Solnhofen Limestone (named after the small town of Solnhofen). Fossils from the Solnhofen Limestone are famous for the exquisite detail they represent, even in cases of very delicate organisms.

In 1860, a single refined, asymmetrical feather was discovered in the Solnhofen Limestone. Discovery of this feather came just one year after the publication of Darwin’s *Origin of Species*, and therefore the discussion of the origins of birds already was underway. About one month later, the first “bird” skeleton was found near Langenthalheim, and thus the evolutionists quickly gathered up their needles and began weaving the yarn of how birds fit into the evolutionary tree. However, we know that increased salinity helps objects

Artist's rendition of  
*Archaeopteryx lithographica*



float, not sink (e.g., as in the Dead Sea). And we know that the bones of most birds have hollow air sacs that likewise would render them more susceptible to floating than sinking. Therefore one is left to wonder why it is that these “birds” of long ago **sank** gently into the carbonate mud of Solnhofen. All the scientific evidence that we possess indicates that these creatures, had they actually been birds in the first place, would instead have **floated** to the surface and decayed, rather than being preserved. On September 30, 1861, German paleontologist Herman von Meyer wrote regarding the Solnhofen discoveries.

Additional to my writing of the fifteenth of last month, I can notify you that I have inspected the feather from Solnhofen closely from all directions, and that I have come to the conclusion that this is a veritable fossilisation in the lithographic stone that fully corresponds with a bird's feather. Simultaneously, I heard from Mr. Obergerichtsath Witte, that the almost complete skeleton of a feather-clad animal had been found in the lithographic stone. It is reported to show many differences with living birds. I will publish a report of the feather I inspected, along with a detailed illustration. As a denomination for the animal I consider *Archaeopteryx lithographica* to be a fitting name... (pp. 678-679).

Thus, from a single fossilized feather *Archaeopteryx lithographica* was born. [*Archaeopteryx* (ark-ee-OP-ta-riks) means ancient (Greek *archae*) wing (*pteryx*).]

### ARCHAEOPTERYX—THE MISSING LINK?

This discovery at Solnhofen provided the ultimate gift of the evolutionary gods to scientists of the day who were searching diligently for something (anything!) in the fossil record that portrayed the combined traits of two distinct classes of animals. *Archaeopteryx lithographica* must have had a considerable impact on a society that already was discussing Darwin's recent proposals regarding the theory of evolution. This “missing link” was the first real evidence that Darwinists felt supported their position of a transition from land-dwelling animals into birds. For over 100 years, evolutionists have considered *Archaeopteryx* the transitional form that allowed land-dwelling animals finally to get off the ground. Today, practically all evolution-based science textbooks contain a breathtaking photographic reproduction and description of *Archaeopteryx*, with genealogical lines showing the descent of modern birds from this ancient “intermediate.”

However, this one “missing link”—which was supposed to revolutionize mankind's understanding of bird evolution—ultimately created more problems for evolutionists than solutions. An ongoing debate as to whether or not this animal was merely a bird or a true intermediate has been continuing non-stop for over a century. And to add to the controversy, some scientists have raised questions publicly as to whether or not *Archaeopteryx* may even be a fraud. An examination into the history surrounding this creature provides an interesting case study in how evolutionary science works. Consider the following:

### *Archaeopteryx*—Specimens, Features, and Feathers

According to paleontologists, the available fossils of *Archaeopteryx* reveal that it was a crow-sized animal that may have been able to fly, but probably not very far. *Archaeopteryx* had a wingspan of about 1.5 feet, was approximately 1 foot long from beak to tail, and likely weighed around 11 to 18 ounces. Compare the features of *Archaeopteryx* with modern-day birds (see table below).

To date, there have been 7 specimens of *Archaeopteryx* found (not including the single feather). The following is a chronological description of each find:

#### *The Feather*

Found in 1860 near Solnhofen, the original *Archaeopteryx* feather was described by von Meyer in 1861. The surprise was the exacting detail of preservation in the fossil.

#### *The London Specimen*

Found in 1861 near Langenthalheim, this fossil of *Archaeopteryx* was announced the same year by von Meyer. This and the Berlin specimen are the best known of all the *Archaeopteryx* fossils. Eventually Carl Haberlein, an amateur fossilologist and local medical doctor, sold it to the British Museum.

#### *The Berlin Specimen*

Originally uncovered in 1877 near Blumentburg, this *Archaeopteryx* find was described by W. Dames in 1884. This is considered a better specimen than the London specimen, principally because it had a complete (albeit badly crushed) head. Carl Haberlein's son, Ernst, eventually sold it to the Berlin Museum.

| Similarities                                                               | Differences               |
|----------------------------------------------------------------------------|---------------------------|
| Feathers                                                                   | Toothed jaw               |
| Furcula or wishbone                                                        | Long bony tail            |
| Hollow bones                                                               | Three claws on each wing  |
| Pectoral girdle was similar                                                | Abdominal ribs (gastrula) |
| Pelvis and legs like a modern bird                                         | Flat sternum (breastbone) |
|                                                                            | Less fusion of hand bones |
|                                                                            | Small cranium             |
| Comparison of <i>Archaeopteryx</i> features with those of modern-day birds |                           |

### *The Maxburg Specimen*

Found in 1958 near Langenthalheim (like the London specimen), it was described in 1959 by Heller. The specimen is composed solely of the torso; currently, its whereabouts is unknown (it is thought to have been sold secretly after the death of its finder and owner, Eduard Opitsch).

### *The Haarlem or Teyler Specimen*

This specimen actually was found near Reidenburg in 1855, five years prior to the feather. However it remained in a museum, classified as *Pterodactylus crassipes* by von Meyer. A re-examination of the fossil in 1970 by Ostrom revealed feathers and its true identity (1970, 170:537).

### *The Eichstatt Specimen*

This specimen was found by Workerszell in 1951, and then described by Peter Wellnhofer of the Paleontological Museum of Munich in Germany. This is the smallest of the specimens, being about two-thirds the size of the others. Although it has many differences from other *Archaeopteryx* specimens, it still resides within *A. lithographica*.

### *The Solnhofen Specimen*

Found in the 1960s near Eichstatt and described by Wellnhofer in 1988, initially this specimen was identified as *Compsognathus*, but later was reclassified as *A. lithographica* (see: Ostrom, 1975, 3:61; Gee, 1999, p. 180).

### *The Solnhofen-Aktein-Verein Specimen*

In 1993, Wellnhofer described a new specimen, but the description is in German and the information is limited. This specimen has been classified as a new species, *Archaeopteryx bavaria*, and is reported to have a small, ossified sternum as well as distinct feather impressions.

## The Strange Case of the “Famous Forged Feathers”

Many evolutionists have regarded *Archaeopteryx lithographica* as one of the most important fossils ever discovered, and as a result it has been touted as the perfect example of evolution in action. However, to others the fossil is a perfect example of **fraud** in action, not evolution. One controversy swirls around the fact that many of the specimens do not show any feather impressions at all, and the two that have impressions both were sold to

museums by the Haberlein family (who apparently also handled the single fossil feather). Karl Haberlein sold his fossil in 1861 to the British Museum for 600 pounds, and his son Ernst sold the second one to the Berlin Museum in 1877 for 36,000 gold marks. Some have suggested that this fossil find is nothing more than a small dinosaur that had feather imprints placed on it after it was discovered. In speaking of *Archaeopteryx* in 1975, John Ostrom wrote:

...these specimens are not particularly like modern birds at all. If feather impressions had not been preserved in the London and Berlin specimens, they [the other specimens—BH/BT] never would have been identified as birds. Instead, they would unquestionably have been labeled as coelurosaurian dinosaurs [such as *Compsognathus*—BH/BT]. Notice that the last three specimens to be recognized were all misidentified at first, and the Eichstatt specimen for 20 years was thought to be a small specimen of the dinosaur *Compsognathus* (3:61).

Even a modern-day dinosaur encyclopedia adds doubt as to the validity of this species. “Apart from the proportions of its wings, the skeleton of *Archaeopteryx* is strikingly similar to that of a small, lightly built, running dinosaur, such as the coelurosaur *Compsognathus*” (Dixon, et al., 1988, p. 172).

While controversy has surrounded *Archaeopteryx* for well over 100 years, only within the last fifteen have some scientists begun to question the actual genuineness of some of the fossil finds. Lee Spetner, a respected Israeli scientist, was one of the first to question the validity of certain *Archaeopteryx* fossils at a meeting of Jewish scientists held in Jerusalem in July 1980. Spetner had studied the British Museum specimen in June 1978, and had pointed out certain discrepancies to Alan Charig, chief curator of fossil amphibians, reptiles, and birds at the Museum. Dr. Spetner went on to publish a brief item titled “Is the *Archaeopteryx* a Fake?” (1983), and later stated: “Our contention is that the feather impressions were forged onto a fossil of a flying reptile” (1988, p. 15). In 1985, renowned British astrophysicist Sir Fred Hoyle joined Spetner to reiterate the allegations that the feather impressions of *Archaeopteryx* were, in fact, a forgery—the result of chicken feathers having been pressed into a cement matrix

that then was applied to two authentic fossils of a small dinosaur. In his assessment, Hoyle suggested that “the only undeniable featherlike impressions are therefore those on the single feather of 1860, on the British Museum specimen of 1961 and the Berlin specimen of 1877,” each of which had been handled by the Haberlein family (1985, p. 694). After examining the specimen in the British Museum (in addition to numerous photographs), Hoyle argued that the impressions of the feathers in the stone were fakes. The evidence of fossil forgery came from the following:

1. The “double-struck” appearance of the feather imprints, which allegedly resulted from a botched forging job rather than natural preservation.
2. The poor fit of the main slab and counterslab of the London specimen, indicating that the forger had tampered with the fossil layers after the rock had been split open in the quarry.
3. The finer-grained nature of the sediment bearing the feather impressions, in comparison to the coarser sediment embedding the bones (Krishtalka, 1989, p. 98).

Hoyle and Spetner, along with several other well-known scientists, including Hoyle’s colleague N.C. Wickramasinghe, eventually published several papers and a small book documenting the evidence that they believed substantiated the fraud (see Hoyle, et al., 1985; Spetner et al., 1988; Watkins, et al., 1985). Hoyle and Spetner presented what appeared to be a strong case for the fabrication of the “Pilt-down Bird,” as many started calling it (a reference to the famous Pilt-down Man hoax of scientific fame). But, as one writer noted:

As might be expected, however, this charge against such a key “proof” of evolution could not be allowed to stand, and evolutionists everywhere were indignant. A number of papers purportedly refuting the fraud allegation were published, and the furor has died down now, with *Archaeopteryx* still offered in proof of evolution by most evolutionists. Unfortunately, these fossils now have been locked away in the basement of the British Museum of Natural History, no longer accessible to public view or further research (Morris and Morris, 1996, 2:67-68).

Additionally the fossils from *Archaeopteryx* have fallen under suspicion as a result of reported instances in which the matching faces of the fossil (the main slab and counterslab) do not match. The feather impressions are primarily on the main slab, while in several places the counterslab has raised areas that have no corresponding indentation on the main slab. These raised areas, nicknamed “chewing gum blobs,” are made of the same fine-grained material that is found only under the feather impressions. The rest of the fossil is composed of a coarser-grained limestone. Some have speculated that these chewing gum blobs probably are the result of small drops of wet cement that fell on the surface but went undetected by the forger (Wickramasinghe and Hoyle, 1986). In 1986 a “definitive” test was performed on the British specimen that cast serious doubt on its authenticity. An X-ray resonance spectrograph of two samples (one from the feather region and a control sample from the non-feathered region) showed that the material containing the feather impressions differed significantly from the rest of the fossil slab. The chemistry of this “amorphous paste” also differed from the crystalline rock that normally is found in the quarry (Wickramasinghe and Hoyle, 1986). In other words, the material that composes the feathered region does not match the rest of the fossil!

The British Museum “contends that the amorphous nature of the feathered material is an artifact explainable by preservatives that

they have put on the fossil” (Spetner, 1990, p. 289). However, if this excuse were correct, then the “preservatives” should have shown up on the control sample as well. The British Museum has refused further testing, which seems to some a rather shocking position for a scientific organization to take, and one that unnecessarily feeds further suspicion. Alan Charig has written a response titled “*Archaeopteryx* is not a Forgery,” in which he and his colleagues attempted to explain these discrepancies (1986). The data in his article, however, are not sufficient to answer the questions raised above. [For additional information on both sides of the *Archaeopteryx* controversy, see Taylor, 1990, pp. 279-291.]

The reader may find it of interest to learn that on September 11-15, 1984, an International *Archaeopteryx* Conference was held in Eichstatt, Bavaria to evaluate the official status of *Archaeopteryx*. In describing the consensus of the evolutionary scientists who attended the conference, Peter Dodson wrote in the *Journal of Vertebrate Paleontology*:

At the end of the three days of presentations, [Alan] Charig [chief curator of fossil amphibians, reptiles, and birds at the British Museum—BH/BT] orchestrated a concerted effort to summarize the ideas for which consensus exists. The general credo runs as follows: *Archaeopteryx* was a bird that could fly, but it was not necessarily the direct ancestor of modern birds.... A communiqué expressing the unanimous belief of all participants in the evolutionary origin and significance of *Archaeopteryx*

was adopted, in order to forestall possible misuse by creationists of apparent discord among scientists (1985, 5: 179).

It is interesting, to say the least, that the scientists at the meeting felt constrained to adopt a unanimous resolution concerning the “evolutionary origin and significance of *Archaeopteryx*” solely because of a desire to prevent creationists from expressing what some of their own colleagues already had pointed out—that *Archaeopteryx* just might not be everything it has been cracked up to be. But, after everything was said and done, the efforts of those attending the 1984 conference to save *Archaeopteryx* appear to have failed anyway. Read on to find out why.

### *Archaeopteryx*—Missing Link or True Bird?

The famous American dinosaur hunter Othniel C. Marsh once said: “He is certainly a wise man who today can tell a bird from a reptile, with only the fragments of an ancient form before him” (1890). Two years after von Meyer published his description of *Archaeopteryx*, Sir Richard Owen, the eminent curator of the British Museum of Natural History, published his own description. As far as Owen was concerned, *Archaeopteryx* was unequivocally a bird—a peculiar and distinctive bird, but a bird nevertheless. So what is it about this famous fossil that has some people seeing birds and others seeing dinosaurs?

The urgency of needing to find some sort of “intermediate” caused evolutionists to concentrate on as many features of *Archaeopteryx* as possible in order to discover “combined” traits. According to Niles Eldredge of the American Museum of Natural History, *Archaeopteryx* had “advanced characteristics of birds and retained a tremendous amount of ‘primitive’ characteristics, like teeth” (as quoted in Sunderland, 1988, p. 78). However, some fish have teeth, some do not. Some amphibians have teeth, and some do not. How can a scientist look at the presence of teeth and simply assume that this animal evolved from something else? Some have suggested that *Archaeopteryx* evolved from the crocodile. However, even the main proponent of the crocodile-to-bird hypothesis, Allan Walker, has stated that the hypothesis “has become so tenuous that it is very difficult to sustain” (1985, p. 133).



**Dr. Bert Thompson**

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Many scientists point out things like an opposable hallux (big toe), the furcula (wish-bone), which is formed by two clavicles that have fused in the midline, and an elongated pubis directed backwards—and see nothing but a bird. Evolutionist Alan Feduccia stated: “Paleontologists have tried to turn *Archaeopteryx* into an earth-bound, feathered dinosaur. But it’s not. It is a bird, a perching bird. And no amount of ‘paleobabble’ is going to change that” (as quoted in Morell, 1993, 259:764). A more recent fossil bird from Mongolia—*Mononychus*—had hands and arms like those of digging animals (as well as teeth), and is dated at only half as old as *Archaeopteryx*. Writing for *Science News*, Richard Monastersky observed:

Mongolian and U.S. researchers have found a 75-million-year-old, bird-like creature with a hand so strange it has left paleontologists grasping for an explanation.... Paul Sereno of the University of Chicago notes that *Mononychus* had arms built much like those of digging animals. Because moles and other diggers have keeled sternums and wrists reminiscent of birds, the classification of *Mononychus* becomes difficult, he says (1993, 143:245).

Thus, evolutionists now are faced with the possibility that birds may have evolved from moles instead of reptiles! Consequently, many scientists are trying to discern how it is that animals which normally burrow in the ground suddenly decided to abandon their usual environment and “just fly away.” [We imagine that a goodly number of farmers would be interested in learning how to get these pesky creatures to abandon their fields and “just fly away”!]

So what is the truth about *Archaeopteryx*? Perhaps the late Colin Patterson, while serving as senior paleontologist at the British Museum of Natural History, summed it up best when he stated that *Archaeopteryx*

has simply become a patsy for wishful thinking. Is *Archaeopteryx* the ancestor of all birds? Perhaps yes, perhaps no: there is no way of answering the question. It is easy enough to make up stories of how one form gave rise to another, and to find reasons why the stages should be favoured by natural selection. But such stories are not a part of science, for there is no way of putting them to the test (as quoted in Sunderland, 1988, p. 102).

In an article published several years ago in *Paleobiology*, Stephen Jay Gould of Harvard, and Niles Eldredge of the American Museum of Natural History, wrote concerning *Archaeopteryx*:

Smooth intermediates between *Bau- pläne* [the German word meaning basic morphological designs or different types of creatures—BH/BT] 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)” [Gould and Eldredge, 1977, 3:147, parenthetical comment in orig.].

The story surrounding *Archaeopteryx* has been complicated by another paleontological discovery that has left many evolutionists scratching their heads in regard to where, exactly, the creature actually fits in the evolutionary scheme of things. The fossil remains of two crow-sized birds 75 million years **older** than *Archaeopteryx* (i.e., approximately 225 million years old according to evolutionary dating schemes) were found near Post, Texas by Sankar Chatterjee and colleagues from Texas Tech University in Lubbock, Texas (see Beardsley, 1986). This new find, designated *Protoavis*, has been controversial since its announcement for several reasons. First, five years passed between its discovery and the publication of Chatterjee’s scientific paper in the *Philosophical Transactions of the Royal Society* (see Chatterjee, 1991). Second, the fossils were badly crushed and jumbled, and no feathers of any kind were visible. Some paleontologists who have seen the fossils are unconvinced that they are the remains of birds. Yet as Dr. Chatterjee (who has gone on the offensive to defend his position) has pointed out, the skull of *Protoavis* has 23 features that are fundamentally bird-like, as are the forelimbs, the shoulders, and the hip girdle. In commenting on this, one author wrote in *Science*: “His [Chatterjee’s—BH/BT] reconstruction also shows a flexible neck, large brain, binocular vision, and, crucially, portals running from the rear of the skull to the eye socket—a feature seen in modern birds but not dinosaurs” (Anderson, 1991, 253:35). Chatterjee has named the find *Protoavis texensis* (first bird from Texas). In 1997, he authored a beautifully illustrated book on the evolution of birds (*The Rise of Birds*), in which *Protoavis* was displayed prominently as being the forerunner of modern birds.

All of this, needless to say, has caused evolutionists severe problems because *Protoavis* appeared at the time of the earliest dinosaurs, which means that if it is accepted as genuine, then birds certainly could not have evolved from dinosaurs and *Archaeopteryx* could not be the ancestor of modern birds. After looking at the evidence for *Protoavis*, Kansas University paleontologist Larry Martin suggested: “There’s going to be a lot of people with *Archaeopteryx* eggs on their face” (as quoted in Anderson, 1991, 253:35).

Regardless of where *Archaeopteryx* is placed, evolutionists still will be left with a lot of explaining to do. How is it that flying could have evolved in **four different species**: insects, birds, reptiles, and mammals? Did **each** have a transitional form? Did all flying animals evolve from one intermediate, and then continue evolving further into mammal form (e.g., bats) and/or insects? As Peter Wellnhofer, the expert on *Archaeopteryx* at the Paleontological Museum of Munich, pointed out: “It is unlikely that a feature as unusual as feathers evolved twice” (as quoted in Gibbons, 1996, 274:720). Unlikely indeed!

### *Archaeopteryx*—Flying Capability

The debate concerning the flying ability of *Archaeopteryx lithographica* began not long after the initial fossil discovery. Scientists argued long and hard about whether the proposed body size and wing strength would permit this creature to get off the ground (see, for example, Yalden, 1971). So if it were the bird from which all modern birds descended, what does the evolutionary trail look like? In an article in *Science* on “The Evolution of Dinosaurs,” evolutionist Paul Sereno stated that “within 10 million years after the appearance of *Archaeopteryx*, the body size shrank to that of a sparrow” (1999, 284:2143). The article went on to suggest that modifications in the feathers and tail structure during this interval had a significant impact on flight and perching performance. Additional studies have suggested a dramatic rise in atmospheric oxygen levels (possibly yielding concentrations reaching levels as high as 35%, compared to today’s 21%) that might have “physiologically facilitated the initial evolution of insect flight metabolism” (Dudley, 2000, 62:135).

The insect-catching scenario postulates that a population of dinosaurs gradually frayed out their forelegs and tail scales, some-

how getting flight feathers with a rigid central shaft and hundreds of delicate parallel barbs running down along it. These barbs contained hundreds of tiny barbules to hook them together, making an effective air seal. Modern feathers are composed of a long, tapering, central rachis, with closely spaced side barbs. The barbs on either side of the rachis form a surface called the vane. The two vanes on the feather may be symmetrical or asymmetrical (in which case the rachis appears closer to one edge of the feather than the other). The flight feathers of modern birds typically are asymmetrical, while body contour (down) feathers are symmetrical. In modern birds, remiges (wing feathers) are highly modified to sustain flight, primarily in that the rachis is shifted toward the leading edge of the feather (i.e. the leading vane is thinner than the trailing vane), resulting in a true asymmetrical feather (see McFarland, 1985). All of this—just to trap insects more efficiently!

Researchers compared the asymmetry of some of the flight feathers of *Archaeopteryx* with those of modern flying and flightless birds, as well as with the Solnhofen feather (see Speakman, et al., 1994). They discovered that the average asymmetry for *Archaeopteryx* feathers was 1.25, which was lower than that of modern flying birds but overlapping that of modern flightless birds. The isolated feather exhibited an asymmetry of 2.2—just within the range of modern flying birds. In addition, *Archaeopteryx*'s claw was compared with the claws of more than 500 species of modern birds. The study found that the pes (hind foot) of the *Archaeopteryx* fell within the average range of perching birds, whereas the middle claws of the manus (front hand) fell within the upper range of the claws of the strongest perching birds and completely within the range of the claws of trunk climbers (Feduccia, 1993, 259:791). The authors of the study thus concluded that in all likelihood, *Archaeopteryx* was a perching bird.

[to be continued]

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## INTRODUCING: OUR NEW DIRECTOR OF SCIENTIFIC INFORMATION

In my “Note from the Editor” in January 2000, I introduced you to Kyle Butt, who had just begun working with us as our new Director of Biblical Research. Kyle has become a tremendous asset to our work. This past January—one year to the day after he joined us—he became the editor of *Discovery*, our monthly paper on scripture and science for children. In addition, we have just received from our printer the new 10-lesson *Christian Evidences Correspondence Course* that he and I co-authored (see my “Note from the Editor” in last month’s *R&R*, advertising the new course). On April 1, we sent to the printer Kyle’s new book on Christian evidences for young people, *Out With Doubt*. And currently he is putting the finishing touches on another new book for younger children about how we got the Bible. Since coming on board, Kyle has distinguished himself in a number of ways.

In this space in January 2001, I introduced you to Eric Lyons, our new Director of Research. And it is safe to say that Eric quickly is becoming a valuable asset in his own right. In the short time he has been here, Eric already has written his first issue of *R&R*, has begun answering huge numbers of inquiries, and has exhibited an uncanny talent in performing the massive amount of in-depth research that is required for us to publish two major journals. Currently, Eric and I are co-authoring a second, intermediate-level *Christian Evidences Correspondence Course*, which we hope to release by late summer. And, last but certainly not least, Eric is distinguishing himself in the position of associate editor of *Discovery* as he works with Kyle to make the paper the best it can be for the 10,000+ children who receive it each month. Both of these talented young men are receiving frequent speaking requests—and rightly so, because they both are knowledgeable in their subject areas and are outstanding speakers.



This month, I would like to introduce you to our newest staff member, Dr. Brad Harrub. Brad came to my attention late last year. Upon receiving a copy of his résumé (sent to me by a friend of our work), I corresponded with him by letter, and then met with him in person, to discuss the possibility of his future employment (as our Director of Scientific Information). Brad, who is 30, holds an earned B.S. degree in biology from Kentucky Wesleyan College, and at the time was a candidate for the Ph.D. degree in neurobiology from the University of Tennessee in Memphis. In addition to being a faithful Christian, he is listed in the 2000 edition of *Who’s Who Among Scientists and Researchers*, is a member of the Society for Neuroscience, and is the author of several articles published in refereed science journals. During his graduate studies, he also worked with young people, spoke at youth rallies, etc.

On April 4, Brad successfully defended his doctoral dissertation, and five days later, on April 9, joined us with a freshly minted Ph.D. in neurobiology. His research skills and knowledge base, I am convinced, will make him just as valuable a part of our work as Kyle and Eric—which is why, effective with this issue of *Reason & Revelation*, you will find Brad listed on the masthead as the new associate editor. He and I will handle issues related to *R&R*, while Kyle and Eric will handle issues related to *Discovery*. From a personal viewpoint, it will be nice to have a coworker with Brad’s training in science to fill in for me whenever I have to turn down requests for speaking engagements (as I frequently do, since I am gone 40+ weekends each year, do not have any openings for 2001 or 2002, and have 2003 over half filled). Please join us in welcoming Brad, his wife, Melinda, and their 15-month-old son, Will. And expect more great things yet to come!

**Bert Thompson**