# Creation Matters

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## Herbivores and Plant Volatiles: Part 2 — Caterpillar Oral Secretions Induce Volatile Release by Host Plants To Attract Wasp Parasitoids


by E.L. Williams, Ph.D. and G.F. Howe, Ph.D.


Research conducted by the USDA Research Service in Gainesville, Florida revealed an interesting interaction of beet armyworm (BAW) herbivores and their host plants, resulting in the attraction of female wasp parasitoids who then lay eggs in the caterpillars. Once parasitized, the BAW caterpillar feeds very little during its remaining lifetime and dies shortly after the mature wasp emerges from it. (Sourakov and Mitchell, 2000)

### Beet armyworm, *Spodoptera exigua* (Hübner)

This insect originated in Southeast Asia and was found in North America around 1876. It "invades the southern half of the United States (Maryland to Colorado to northern California, and south)..." each year (Capinera, 2004). The classification of the organism is Insecta > Lepidoptera > Noctuidae.

The larvae (caterpillars) of this moth are quite destructive and attack many plants such as vegetables, field crops, weeds and flowers (Table 1). Excessive insecticide usage can cause infestations of BAW on many plants (Capinera, 2004).

A mature larva of the BAW is shown in Figure 1. The color of the caterpillars can vary as they grow. Females of the parasitic wasp [*Cotesia marginiventris* (Cresson); Insecta > Humenoptera > Braconidae] are natural enemies of the caterpillar (Alborn et al., 1997). A female wasp is shown in Figure 2 depositing eggs in the larvae of the BAW.

*Figure 1. A larva of the beet armyworm showing damage to the foliage of cotton. Photograph by Ronald Smith, Auburn University. Image no. 1858056.*

### Attracting wasps

Using corn seedlings (*Zea mays* L.) as hosts of the feeding BAW caterpillars, the USDA researchers extracted volicitin [N-(17-hydroxylinolenoyl)-L-glutamine] from the oral secretions of the larvae, which induces the damaged corn to release a blend of volatile terpenoids and indole which then attracted wasps to the feeding herbivores. The USDA investigators later were able to synthesize volicitin. Both the natural and synthesized volicitin, when applied to damaged corn leaves, induced the plant to emit the same blend of volatile wasp attractants (Alborn et. al., 1997).

Natural volicitin "... consisted exclusively of the L-glutamine form." (Alborn et al., 1997). Interestingly, volicitin could be synthesized with either D- or L-glutamine, but only the L-glutamine form was active in causing the plants to release terpenoids and indole. Also, a racemic mixture of 17-hydroxylinolenic acid, D-glutamine, and L-glutamine was not active. A revealing discussion on the existence exclusively of levorotatory components in proteins (Coppedge, 1971) is well worth reading as background.

What does the host plant provide in the formation of volicitin?

> ... biochemical data demonstrate that the plant supplies linolenic acid, which is required for growth and development of beet armyworms, and also provides this fatty acyl chain for the synthesis of volicitin... (Pare et al. 1998).

As corn leaves provide nutrition for the BAW herbivore, they are also supplying


... continued on p. 5


## Contents

# Cold Comfort for Long-Agers

## Hugh Ross' Superficial Interpretation of Ice Core Data

by Michael Oard, Larry Vardiman, and Carl Wieland

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The well-known proponent of "progressive creation" and "millions of years," Hugh Ross, claims that the "old age" of the earth derived from ice cores is a scientific argument that "…may be simple enough for everyone to understand, regardless of science background — as simple as counting tree rings."[1] He goes on to state:

> The ice cores reveal hundreds of thousands of ice layers laid down on top of one another year by year, just as a tree adds one new growth ring per year.[1]

He lists the three new deep ice cores from the top of the Greenland Ice Sheet — the NorthGRIP, GISP2 and GRIP cores — and the three deep ice cores from the top of the Antarctic Ice Sheet — Dome Fuji, Vostok, and Dome C. The Dome C core is said to have reached 740,000 years (740 kyr), but just recently it has been drilled down to the 900 kyr age level. You can read more about the issue of ice cores in the new book *The Frozen Record: Examining the Ice Core History of the Greenland and Antarctic Ice Sheets*.[2]

Ross makes it seem that annual layers were counted to many hundreds of thousands of years in these ice cores. Actually, it is only the GISP2 core where annual layers have been "counted," and they were counted to only "110,000" years, near the bottom of the core. It is very important to understand that most of these alleged annual layers are concentrated in the bottom several hundred meters of the core, and that their interpretation as "annual" is very questionable. Glaciologists expected to see several glacial/interglacial 100,000-year cycles in the Greenland core, but the evidence points to one ice age. (Antarctic ice cores are a different situation, as explained below.)

Ross goes on to point out that glaciologists "know" that the layers are annual because of volcanic ash signatures, climatic cycles, radiometric dating of minerals embedded in the ice, and a 3.9-million-year deep-sea core off New Zealand's Southern Alps. He emphasizes that the Milankovitch climatic cycles, as well as the deep-sea core off New Zealand, "match perfectly" with the dates from the ice cores. Ross summarizes what he thinks is irrefutable, simple evidence that anyone can understand:

> Such a calibration builds confidence that these cores yield a continuous climatic, geological, and astronomical record for the past few million years at least.[1]

### Problems

There are a host of problems with Ross' simplistic understanding of ice cores. First, volcanic ash signatures beyond about 200 years are equivocal for a number of reasons, especially because the historical record older than 200 years becomes more sketchy the older the eruption. Two thousand years seems to be the maximum for which any volcanic ash signal and the historical record can be correlated.[3] Hammer, who was the first scientist to use volcanic signatures, states:

> The use of volcanic reference horizons in ice cores, however, has not been widely used. The reason is twofold: First, before volcanic horizons could be used for dating purposes it was necessary to establish a time scale independent of any subjective interpretations of the volcanic signals (by seasonal variables). Second, the information on past volcanic eruptions is limited and the dating of the eruptions is not very precise, apart from certain well-documented historical eruptions.[4]

Second, the use of climatic cycles from the astronomical or Milankovitch theory of the ice age (Ross' second and fourth indicator above) is an exercise in circular reasoning.[5] Both the Greenland and Antarctic ice cores are *tuned* to the deep-sea cores, which are dated *assuming* the astronomical or Milankovitch theory of the ice age:

> Taking advantage of the fact that the Vostok deuterium (äD) record now covers almost two entire climate cycles, we have applied the orbital tuning approach to derive an age-depth relation for the Vostok ice core, which is consistent with the SPECMAP marine time scale [from deep-sea cores]…The deep-sea core chronology developed using the concept of "orbital tuning" or SPECMAP chronology…is now generally accepted in the ocean sediment scientific community.[6]

"Orbital tuning" refers to the cycles in the astronomical theory. This quote is referring to the first two cycles in the Vostok core, but since then, glaciologists have drilled deeper at Vostok and added more cycles from Dome Fuji and Dome C — clear to the ninth cycle in Dome C. This is how the Antarctic ice cores are dated — simply by curve matching with deep-sea cores!

Annual layers cannot be derived from ice cores drilled on top of the Antarctic Ice Sheet, as implied by Ross, since the snow-

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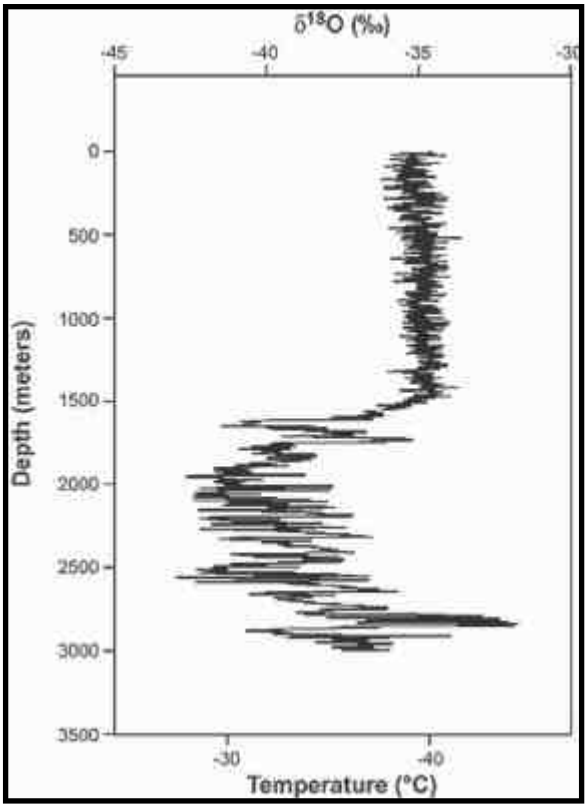
fall rate (less than 5 cm of water equivalent per year) is too light for annual layer dating. As far as the strong oscillations in äD, presumably correlated to temperature, in these Antarctic cores are concerned, Oard suggests that they are similar to the large oscillations in the Greenland Ice Age portion of the cores but with higher amplitude.[7]

Further evidence of circular reasoning, via tuning the ice core chronology to the astronomical theory of the ice age, is shown in the Greenland ice cores. This was demonstrated when Deborah Meese and colleagues first dated the GISP2 core by "annual layers" down to the 2,800 meter level at 85,000 years BP (before present).[8] However, the date at this level disagreed with the deep-sea cores and the astronomical theory, so the layer between 2,300 and 2,800 meters was 'remeasured' to a finer resolution. They found 25,000 more annual layers in that 500-meter interval to arrive at 110,000 years at 2,800 meters, just as expected from the chronology from deep-sea cores![9]

Glaciologists do measure annual layers near the top of the Greenland ice cores, but deeper down the cores, they are picking up subannual layers (storm layers and other variations). The uniformitarian scientists are simply assuming the ice sheets are old, and so "old age" is what they find. Creationists have an alternative interpretation in which the post-Flood, rapid Ice Age causes very thick annual layers during the Ice Age followed by a decrease to the current annual snowfall of today.[2,10-14]

The third indicator, according to Ross, is radiometric dating of minerals embedded in the ice. Ross does not provide a reference, and we do not know to what he is referring. Since Ross mentions that the dating is on radioactive minerals in the ice, in situ carbon-14 measurements on gas bubbles in the ice and beryllium-10 measurements on ice are eliminated. The minerals in the ice are likely from dust blown onto the ice sheet after erosion from some other area. There is no theoretical reason why the dates of the dust particles should agree with the age of the ice determined by other uniformitarian methods. But Ross, exaggerating, says that in each case when they compare dates, the dates "agree"!

He goes on to chastise young-earth creationists who have written on the subject by citing only a sample of the creationist literature,[15-17] claiming that we have done an incomplete analysis on the ice cores. He claims that Vardiman and Oard have shown problems at the top and bottom of the cores that we claim invalidate the whole dating analysis. Vardiman presented another variable, besides temperature change, to account for the general trend of the oxygen isotope ratios in the ice age portion of the Greenland cores. This work was based on the well-known continental effect applied to gradually-increasing sea ice.[18]




*The oxygen isotope ratio to bedrock for the GISP2 core at the summit of the Greenland Ice Sheet. Oxygen isotopes are generally correlated to temperature with more negative numbers being colder. The oxygen isotope ratios show one ice age with a warm start below 1600 meters followed by the present steady state climate above 1600 meters. Supposed annual layer dating was done to about the 2800-meter level.*

Oard presented problems of simply assuming that uniformitarian scientists have counted 110,000 annual layers down the GISP2 ice core.[16] These two studies relate to more than the top and bottom of the Greenland ice cores. Ross never analyzed the merits of the two studies nor refuted any of the conclusions or suggestions. Furthermore, he has not included several of Oard's latest challenges to the conventional ice core interpretation.[19-21] Ross' challenge is a very incomplete analysis of the literature available before he wrote his article. In addition, he misinterprets the little he has read.

Ross also mentions the possible disturbance at the bottom of the GISP2 core, which was not even referenced by Vardiman or Oard. The disturbance in the bottom 200 meters of the GISP2 cores was used to invalidate an interpretation from the nearby GRIP core of huge abrupt climate changes during the last supposed interglacial. This disturbance does not look too significant to us, and previous conclusions of wild fluctuations at the bottom of the GRIP core seem more correct.[22]

Ross then claims that Wieland's analysis of the lost squadron of planes buried below 250 feet of ice in 50 years was offered as proof against the uniformitarian dating of the Greenland ice cores.[23] Wieland was using this example to show that it does not take a vast amount of time to lay down thick layers of ice.[24] Ross correctly points out that the southeast corner of the Greenland Ice Sheet is a relatively warm area with very high snowfall. However, this situation shows that with a different climate regime during the Ice Age with no sea ice and a warm ocean, the rapid development of the Greenland Ice Sheet could occur.[25] Of course, the snowfall rate is much less at the top of the high ice sheet today. However, even at the current average snowfall for the whole Greenland Ice Sheet, it still would take only 5,000 years to deposit all the ice.[26]

Such superficial research and interpretation seems to be typical of Ross' style: just go to the journals and believe all that the uniformitarians say — hook, line, and sinker. Based on his demonstrated total reliance on uniformitarian *interpretations and speculations* (as some have suggested, Ross' so-called 67th book of the Bible), he shows that he has read little of both the uniformitarian and creationist literature on the subject of ice cores.

Ross tries to makes a case at the end of his article that God also speaks to us from nature, and that both special and general revelation should agree. While we believe that God indeed speaks to us through general revelation, we also believe that nature is subservient to God's Word; i.e., the Bible comes first. And besides, Ross believes more in the *speculations* of sinful men who were not there and who are antagonistic

towards God's Word. He also downgrades God's clear word in Genesis 1 when he says such things as:

> The ice and sediment cores provide compelling extrabiblical evidence that the earth is indeed ancient. This evidence supports the *literal* interpretation of creation days in Genesis 1 as six long epochs.[27] [emphasis added]

We believe that the raw data of nature agree with the Bible and young earth creationism — i.e., with a straightforward reading of Genesis as history, just as the Lord Jesus Christ took it to be. Furthermore, both the Bible and the data of science refute Ross' ideas.[28-31]

## Acknowledgement

We thank Russ Humphreys for pointing out and providing a copy of the Ross article.

## References


1. Ross, H., Deep core tests for the age of the earth. *Connections* **7** (3), p. 2, 2005.
2. Oard, M. J., *The Frozen Record: Examining the Ice Core History of the Greenland and Antarctic Ice Sheets*. ICR Technical Monograph, Institute for Creation Research, Santee, California, 2005.
3. Oard, Ref. 2, pp. 99-101.
4. Hammer, C. U., Dating by physical and chemical seasonal variations and reference horizons, In, Oeschger, H. and Langway, Jr., C. C. (editors), *The Environmental Record in Glaciers and Ice Sheets*, John Wiley & Sons, New York, p. 114, 1989.
5. Oard, Ref. 2, pp. 111-122.
6. Waelbroeck, C., Jouzel, J., Labeyrie, L., Lorius, C., Labracherie, M., Stiévenard, M., and Barkov, N. I., A comparison of the Vostok ice deuterium record and series from southern ocean core MD 88-770 over the last two glacial-interglacial cycles. *Climate Dynamics* **12**, pp. 113,114, 1995.
7. Oard, Ref. 2, pp. 134-135.
8. Meese, D. A., Alley, R. B., Gow, A. J., Grootes, P., Mayewski, P. A., Ram, M., Taylor, K. C., Waddington, E. D., and Zielinski, G., Preliminary depth-age scale of the GISP2 ice core. *U. S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory Special Report 94-1*, 1994.
9. Meese, D. A., Gow, A. J., Alley, R. B., Zielinski, G. A., Grootes, P. M., Ram, M., Taylor, K. C., Mayewski, P. A., and Bolzan, J. F., The Greenland Ice Sheet Project 2 depth-age scale: Methods and results, *Journal of Geophysical Research* **102** (C12), pp. 26,417-26,419, 1997.
10. Vardiman, L., *Ice Cores and the Age of the Earth*, Institute for Creation Research, El Cajon, California, 1993.
11. Vardiman, L., *Sea-Floor Sediment and the Age of the Earth*, Institute for Creation Research, El Cajon, California, 1996.
12. Vardiman, L., *Climates Before and After the Genesis Flood*, Institute for Creation Research, El Cajon, California, 2001.
13. Oard, M. J., *An Ice Age Caused by the Genesis Flood*. Institute for Creation Research, El Cajon, California, 1990.
14. Oard, M. J., *Frozen in Time: Woolly Mammoths, the Ice Age, and the Bible*, Master Books, Green Forest, Arkansas, 2004.
15. Vardiman, L., Rapid changes in oxygen isotope content of ice cores caused by fractionation and trajectory dispersion near the edge of an ice shelf. *TJ* **11** (1):52-60, 1997.
16. Oard, M. J., Do Greenland ice cores show over one hundred thousand years of annual layers? *TJ* **15** (3):39-42.
17. Wieland, C., The lost squadron, *Creation Ex Nihilo* **19** (3):10-14, 1997.
18. Oard, Ref. 2, pp. 154-155.
19. Oard, M. J., Wild ice-core interpretations by uniformitarian scientists, *TJ* **16** (1):45-47, 2002.
20. Oard, M. J., Are polar ice sheets only 4500 years old? *Impact 61, Acts and Facts* (July), Institute for Creation Research, El Cajon, California, 2003.
21. Oard, M. J., Ice cores vs the Flood. *TJ* **18** (2):58-61, 2004.
22. Oard, Ref. 2, pp. 126-128.
23. Ross, Ref. 1, pp. 2-3.
24. Wieland, C., 'Glacier Girl' reminds us that it *doesn't* take millions of years to form deep layers of ice. *Creation Ex Nihilo* **26** (1):20-21, 2004.
25. Oard, Ref. 2, p. 7.
26. Oard, Ref. 2, p. 2.
27. Ross, Ref. 1, p. 3.
28. Sarfati, J., *Refuting Compromise — A Biblical and Scientific Refutation of "Progressive Creationist" (Billions of Years), as Popularized by Astronomer Hugh Ross*, Master Books, Green Forest, Arkansas, 2004.
29. Van Bebber, M. and Taylor, P. S., *Creation and Time—A Report on the Progressive Creationist Book by Hugh Ross*, Second edition, Eden communications, Mesa, Arizona, 1995.
30. Faulker, D., *Universe by Design—An Explanation of Cosmology and Creation*, Master Books, Green Forest, Arkansas, 2004.
31. Williams, A. and Hartnett J., *Dismantling the Big Bang—God's Universe Rediscovered*, Master Books, Green Forest, Arkansas, 2005.

material that will form a component of volicitin, that in turn induces the plant to produce volatiles which signal to wasps to "come and get it." The wasps then lay eggs in the BAW. The wasp larva living inside a BAW eventually kill it. This continues the life cycle of the wasp and decreases the amount of plant destruction by the BAW herbivore.

## Feeding on cotton

If volicitin is applied to mechanically damaged leaves of cotton (*Gossypium hirsutum* L.), it induces the release of terpenoids and indole similar to corn. Other volatiles are released which are unique to each plant (Alborn et al., p. 947). One wonders whether the differences in the mixture of volatiles emitted from a plant may allow parasitic wasps to differentiate between the species of plant under attack and the specific herbivore causing the damage.

Both corn and cotton react to BAW secretions in a total system response such that volatiles also are emitted from the undamaged leaves of the wounded plant. The quantity of emission is greatest during the middle of the day when wasps are actively foraging for prey. The amount of gases being produced decreases at night when the wasps are not active. Induced volatiles are given off by cotton about 24 hours after the commencement of herbivore feeding, thus indicating de novo synthesis of the compounds (Pare and Tumlinson, 1997a; 1997b; Rose et al., 1996; Loughrin et al., 1994).

*Figure 2. A female Braconid wasp parasitizing beet armyworms. Note the color of the larvae is yellow-green at this stage of development. This amazing photograph was taken by Debbie Waters, University of Georgia. Image no. 1739038.*

## Summary and conclusion

The authors suggest that readers consult Part 1 of this series (Williams and Howe, 2005) to orient their thinking concerning this amazing plant defense mechanism and its origins implications.

The BAW, its plant host, and the wasp parasitoid have an amazingly complex relationship. By eating the plant tissue, the BAW is nourished with linolenic acid. Yet the same compound is used in the production of volicitin. This product induces the plant to release volatile compounds, which in turn attract wasps that will eventually result in the death of the herbivore while continuing the life cycle of the wasp.

By no stretch of the scientific imagination could it be proposed that such a back-and-forth sequence involving the plant, herbivore, and parasitoid be seen as arising by evolution. The entire complex sequence, in the opinion of the authors, supports creation by a very wise Creator.

***Table 1.***
**Examples of Plants Known To Be Susceptible to Beet Armyworm Infestations [a] (after Capinera, 2004).**

| |
|---|
| ***Vegetable Plants*** |
| asparagus, bean, beet, broccoli, cabbage, cauliflower, celery, chickpea, corn, cowpea, eggplant, lettuce, onion, pea, pepper, potato, radish, spinach, sweet potato, tomato, turnip |
| ***Field Crops*** |
| alfalfa, corn, cotton, peanut, safflower, sorghum, soybean, sugar beet, tobacco |
| ***Weeds*** |
| lambs-quarters, mullein, pigweed, purslane, Russian thistle, parthenium, tidestromia |
| ***Flowers*** |
| many ornamental plants |

[a] Due to the development of resistance, infestations of the beet armyworm can occur if plants have been subjected to excessive insecticide usage.

## References

*Editor's note: All photos used by permission. www.forestryimages.com*

Alborn, H.T., T.C.J. Turlings, T.H. Jones, G. Stenhagen, J.H. Loughrin and J.H. Tumlinson, 1997. An elicitor of plant volatiles from beet armyworm oral secretion. *Science* 276:945-949.

Capinera, J.L. 2004. *Featured Creatures: Beet Armyworm*. University of Florida, Publication Number EENY-105. http://creatures.ifas.ufl.edu/veg/leaf/beet_armyworm.htm.

Coppedge, J.F. 1971. Probability and left-handed molecules. *Creation Research Society Quarterly* 8:163-174.

Loughrin, J.H., A. Manukian, R.R. Heath, T. C.J. Turlings and J.H. Tumlinson. 1994. Diurnal cycle of emission of induced volatile terpenoids by herbivore-injured cotton plants. *Proceedings of the National Academy of Sciences of USA* 91:11836-11840.

Pare, P.W., H.T. Alborn and J.H. Tumlinson. 1998. Concerted biosynthesis of an insect elicitor of plant volatiles. *Proceedings of the National Academy of Sciences of USA* 95:13971-13975.

Pare, P.W. and J.H. Tumlinson. 1997a. De novo biosynthesis of volatiles induced by insect herbivory in cotton plants. *Plant Physiology* 114:1161-1167.

Pare, P.W. and J.H. Tumlinson. 1997b. Induced synthesis of plant volatiles. *Nature* 385:30-31.

Rose, U.S.R., A. Manukian, R.R. Heath and J.H. Tumlinson. 1996. Volatile semiochemicals released from undamaged cotton leaves: A systemic response of living plants to caterpillar damage. *Plant Physiology* 111:487-495.

Sourakov, A. and E. Mitchell. 2000. *Featured Creatures: A Wasp Parasitoid: Cotesia marginiventris.* University of Florida, Publication Number: EENY-123. http://creatures.ifas.ufl.edu/misc/wasps/cotesia_marginiventris.htm

Williams, E.L. and G.F. Howe. 2005. Herbivores and plant volatiles: Part 1 — Tobacco and tomato plants. *Creation Matters* 10(3):1.

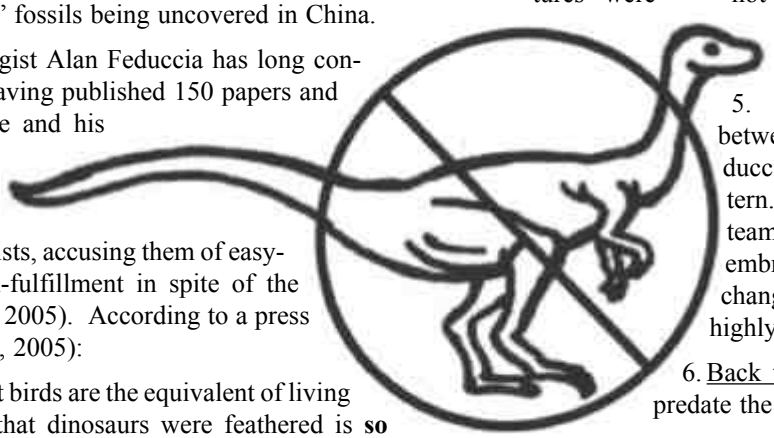
# Speaking of Science

## Commentaries on recent news from science

*Editor's note: All S.O.S. (Speaking of Science) items in this issue are kindly provided by David Coppedge. Opinions expressed herein are his own. Additional commentaries and reviews of news items by David, complete with hyperlinks, can be seen at: www.creationsafaris.com/crevnews.htm. Unless otherwise noted, emphasis is added in all quotes.*

### Have We Been Sold a Bill of Goods About Feathered Dinosaurs and Bird Evolution?

Most people remember the poignant moment at the end of *Jurassic Park* when the professor, on a flight away from his harrowing experiences on the island of dinosaurs run amok, sees a flock of modern birds and ponders their peaceful existence as descendants of the velociraptors and tyrannosaurs that nearly killed him and his friends. The story of birds evolving from dinosaurs has taken on the status of confirmed truth in the minds of many. This has been reinforced by repeated announcements of alleged "feathered dinosaur" fossils being uncovered in China.



Yet, paleontologist Alan Feduccia has long contested this view. Having published 150 papers and six major books, he and his colleagues have just come out swinging against his fellow evolutionists, accusing them of easy-believism and wish-fulfillment in spite of the evidence (Feduccia, 2005). According to a press release (Williamson, 2005):

> "The theory that birds are the equivalent of living dinosaurs and that dinosaurs were feathered is **so full of holes** that the **creationists have jumped all over it**, using the **evolutionary nonsense** of 'dinosaurian science' as **evidence against the theory of evolution**," he said. "To paraphrase one such individual, 'This isn't science . . . This is **comic relief**.'"

Although Feduccia believes birds and dinosaurs had a common reptilian ancestor, he has argued,

> "to say dinosaurs were the ancestors of the modern birds we see flying around outside today **because we would like them to be** is a **big mistake**."

His team, using powerful microscopes, compared the skin of reptiles, the effects of skin decomposition, and the alleged "protofeathers" on fossils. Here are some of the reasons cited in the press release for their doubting the dino-to-bird evolution story:

1. Resemblance only: "They found that fossilized patterns that resemble feathers somewhat also occur in fossils known not to be closely related to birds and hence are far more likely to be skin-related tissues...."

2. Taxonomy confusion: "Much of the confusion arose from the fact that in China in the same area, two sets of fossils were found. Some of these had true feathers and were indeed birds known as 'microraptors,' while others did not and should not be considered birds at all."

3. Preservation bias: Because collagen has low solubility in water and is tough, "we would expect it to be preserved occasionally from flayed skin during the fossilization process," Feduccia said.

4. Wanting to believe: The strongest case for feathered dinosaurs was *Sinosauropteryx*, found in 1996, which sported a coat of "dino-fuzz." Some concluded this fuzz provided insulation and pointed to the possibility dinosaurs were warm-blooded. Major journals presented *Sinosauropteryx* as definitive evidence for feathered dinosaurs, complete with artist renditions of colorful feathery coats on the creatures. "Yet no one ever bothered to provide evidence — either structural or biological — that these structures had anything to do with feathers," said Feduccia. "In our new work, we show that these and other filamentous structures were not protofeathers, but rather the remains of collagenous fiber meshworks that reinforced the skin."

5. Fumble fingers: The most critical link between dinosaurs and birds, according to Feduccia, has been the three-fingered hand pattern. Dinosaurs used digits 1, 2, and 3, but the team found that developing bird wings in the embryo derive from digits 2, 3 and 4. "To change so radically during evolution would be highly unlikely," the article states.

6. Back to the future: The earliest known birds predate the feathered dinosaurs:

> ... the current feathered dinosaurs theory **makes little sense time-wise**, either because it holds that all stages of feather evolution and bird ancestry occurred some 125 million years ago in the early Cretaceous fossils unearthed in China.
>
> "That's some **25 million years after the time of Archaeopteryx**, which **already was a bird in the modern sense,**" he said. **Superficially** bird-like dinosaurs occurred some 25 million to **80 million years after the earliest known bird**, which is 150 million years old."

Feduccia himself had studied *Archaeopteryx* in detail:

> He determined its flying ability by observing that the fossil's feathers had leading edges significantly shorter than their trailing edges, which is characteristic of all modern flying birds.

With all these evidences against bird-from-dinosaur evolution, why would the story take hold so deeply in the popular mind and in scientific circles? Feduccia argues that the promoters simply wanted to believe it. In a ruthless attack, he claimed that the desire to believe and promote this story indicates a serious collapse of credibility in the field of paleontology:

> Feduccia said the **publication** and **promotion** of feathered dinosaurs by the popular press and by **prestigious jour-**

**nals** and magazines, including National Geographic, Nature, and Science, have made it difficult for opposing views to get a proper hearing.

> "With the advent of 'feathered dinosaurs,' we are truly witnessing the beginnings of the **meltdown of the field of paleontology**," he said. "Just as the discovery [of] a four-chambered heart in a dinosaur described in 2000 in an article in Science turned out to be an **artifact**, **feathered dinosaurs too have become part of the fantasia of this field**. Much of this is part of the **delusional fantasy** of the world of dinosaurs, the **wishful hope** that one can finally study **dinosaurs at the backyard bird feeder**."

So what does Feduccia himself believe about the evolution of birds? "It is now clear that the origin of birds is a much more complicated question than has been previously thought," he said.

Is it possible that the leading scientific journals in the world, including *Nature* and *Science* – both of which highlighted artwork of feathered dinosaurs on their covers – were capable of falling for and promoting a "delusional fantasy"? Does this mean that major museums, like the Natural History Museum of Washington, DC and many others, with their "Birds are Dinosaurs" displays, are promoting falsehoods based on flawed evidence? Does this mean the traveling museum exhibit of feathered dinosaurs is a fraud?

Is it possible that evolutionary paleontology is imploding from the credibility gap caused by this lapse of rigor? Does this raise the possibility that Darwinists are wrong about other claims? You heard it right here – from an evolutionist – chagrined at the fact that these "wishful hopes" touted as fact have given ammunition to the creationists.


Williamson, D. 2005. Latest study: scientists say no evidence exists that theropod dinosaurs evolved into birds. *UNC News Services, News Release No. 477*, 10 October. www.unc.edu/news/archives/oct05/feducci100705.htm

Feduccia, A., T. Lingham-Soliar, and J. R. Hinchliffe. 2005. Do feathered dinosaurs exist? Testing the hypothesis on neontological and paleontological evidence. *J. of Morphology* 266(2): 125-166.


## Dover I.D. Trial Calls Star Witness

Michael "Irreducible Complexity" Behe, the Lehigh biochemist famous for flagella, mousetraps and black boxes, took the stand in the Dover, Pennsylvania trial Monday Oct. 17. This was widely reported (Associated Press, 2005; Powell, 2005).

Behe snowed some of the listeners with technical jargon, but otherwise maintained his position that evidence for intelligent design in biology is overwhelming, based on positive evidence, not admissions of ignorance. He also took swipes at the ability of Darwinian mechanisms to explain molecular machines.

Other school boards are watching this trial with both interest and trepidation. Powell said,

> More school boards are considering mandating mention of intelligent design. Randy Tomasacci, a school board member from Shickshinny, north of Harrisburg, said his board is debating whether to require teachers to spend a few days on intelligent design. We're thinking about it," he said. "But we don't want to get sued out of existence."

For Behe's part, he is safe. Though Lehigh University, where he teaches, has repudiated intelligent design, Behe has tenure and (unlike some other ID supporters) cannot be terminated for his views. Reporters and critics, meanwhile, seemed fixated on Behe's Catholicism and on whether he believed the Designer is God.

Can't the reporters get fixated on the evidence instead? Maybe they would learn something about science instead of the secret motivations of their caricatured foes.


Associated Press. 2005. Evolution isn't enough, professor says. *MSNBC News*, 17 October. www.msnbc.msn.com/id/9729036/

Powell, M. 2005 Pa. professor testifies of doubts about Darwin. *Washingtonpost.com*, 18 October. www.washingtonpost.com/wp-dyn/content/article/2005/10/17/AR2005101701579.html

# Creation Calendar

**Note:** Items in "Creation Calendar" are for information only; the listing of an event does not necessarily imply endorsement by the Creation Research Society.

**2006**

June 8 - 10
*Annual Meeting of Board of Directors*
Creation Research Society
Lancaster, SC

August 25-27
Grand Canyon 3-Day Rafting Trip
Canyon Ministries (Tom Vail) and Creation Safaris (David Coppedge)
Registration: $710 per person (call or email for details)
Contact: David Coppedge, 661-298-3685 bwana@creationsafaris.com

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# All by Design

## Feeding in the Dark: Part 1

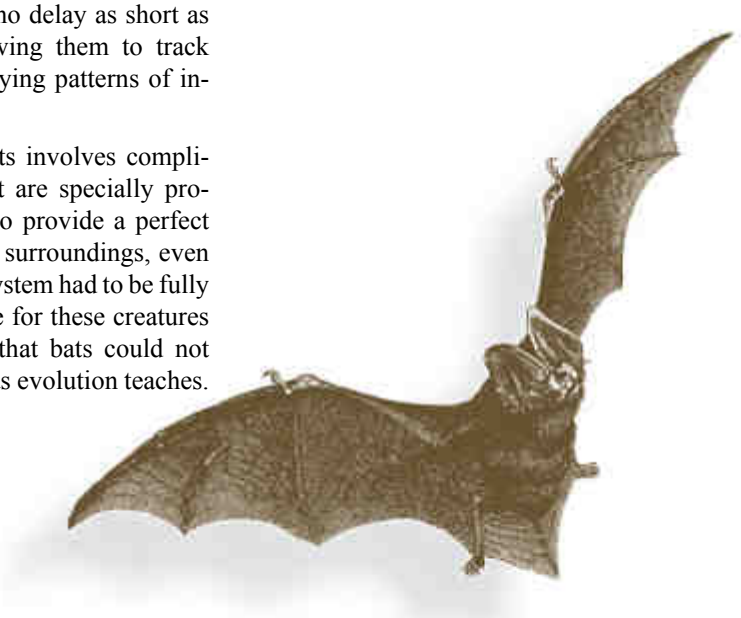
by Jonathan C. O'Quinn, D.P.M., M.S.

There are approximately 700 species of bats that use sonar to locate prey and map out the world around them, a process known as echolocation. These bats produce ultrasonic vocalizations that reflect from prey items and other objects. Characteristics of returning echoes are processed by the bats' brains to determine position, size and other features of sonar targets, serving as an acoustic imaging system.

Bat sonar signals can be of constant frequency or begin at one frequency and then change to another frequency. Bats can vary the type of signals they produce to provide better images of their surroundings and of insects, depending on the local environment, such as dense foliage versus open spaces. Hunting bats emit longer-duration sounds at a slower rate as they scan the air.

As insects are located, bats home in on them by using shorter-duration sounds at an increasing rate. Bats can gauge their distance to a flying insect based upon the time delay between their outgoing ultrasonic sounds and the returning echoes. Bats can detect differences in echo delay as short as 60 microseconds, allowing them to track even the most erratic flying patterns of insects.

Echolocation in bats involves complicated sonar signals that are specially processed by their brains to provide a perfect map of their immediate surroundings, even in total darkness. This system had to be fully functional from day one for these creatures to survive, suggesting that bats could not have evolved in stages as evolution teaches.



## Bibliography:

Moss, C.F. and S.R. Sinha. 2003. Neurobiology of echolocation in bats. *Current Opinion in Neurobiology* 13:751.