No Time for Evolution

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The origin of all living things has two basic possibilities: creation by natural causes alone without involving intelligence or by design involving intelligence. While it may not be possible to conclusively prove which produced the biosphere, it may be possible to determine which did not, leaving the other standing by the process of elimination (eliminative induction). Origin by natural causes alone is advanced by Evolution theory, and origin involving intelligence is advanced by Intelligent Design theory.

Intelligent Design theory finds design in biological creatures, notably from specified complexity and irreducible complexity, which could not have come from natural causes alone. While time is not a factor in Intelligent Design, enormous amounts of it are required by the theory of Evolution. The recognition of complexity in a biological organism has not altered the view of Evolution theory advocates that "it evolved", but complexity has made long ages even more necessary. Without many millions of years, evolution of the biosphere would not be possible.

Potassium-Argon, Uranium-Lead, and other long half-life radiometric dating methods have been crucial evidence for the geologic time scale. Critics point out flaws in essential assumptions such as open rather than closed systems (including zircons) and the possible presence of daughter products of radiogenic elements during the crystallization of minerals. Such objections may introduce some doubt, but they have not reduced reliance on this evidence for the long ages required by Evolution theory.

We present several independent lines of evidence that contradict long half-life radiometric dates and severely shorten the geologic time scale: 1) Carbon-14 dating of dinosaur bones to ~31,000 years before present, 2) the survival of soft, flexible tissue in

dinosaur bones, and 3) the simultaneous formation of multiple strata by deposition in moving water. Taken together, these indicate that, at least from the middle Mesozoic to the present, the putative millions of years were never there. This renders the evolution of much of the biosphere impossible, eliminating Evolution theory as a solution to the question of origins.

Introduction

How life in the universe actually began is a mystery. Either it happened by natural causes alone without involving intelligence or by design involving intelligence. Origin by natural causes alone is advanced by Evolution theory, and origin involving intelligence is advanced by Intelligent Design theory. There may be a variety of positions within the members of this dichotomy, such as the Punctuated Equilibrium version of Evolution theory by Gould and Eldridge[1] that accounts for the lack of transitional fossils throughout the fossil record.

The success of scientific theories should be determined by how well they explain the data. Our knowledge of the development of biological mechanisms and systems is still incomplete, so it may not yet be possible to present proof that one theoretical choice is correct. But there may now be sufficient evidence to rule one out. Since there are only two mutually exclusive possibilities -- creation of organisms with the involvement of intelligence or without -- if one can be ruled out then the other remains by process of elimination (eliminative induction).

It may seem that creation involving intelligence could never be ruled out because a supernatural being could do anything imaginable. But the source and nature of the designing intelligence is beyond the purview of Intelligent Design theory, which only concludes that there are signs of intelligence in the design of biological creatures. It makes no speculations beyond that. Either signs of intelligent design exist or they do not. Even staunch proponents of Evolution theory such as Richard Dawkins acknowledge that biological creatures exhibit "apparent design"[2], but believe natural forces are sufficient to produce it without involving intelligence. The SETI program

searches for signs of intelligence in electromagnetic emissions from beyond the Earth, using criteria that distinguish intelligent signals from random ones. Biological creatures are much more available for close study, and their molecular systems are intensively investigated. Intelligent Design theory uses specific criteria to identify or refute signs of intelligence in the design of biological creatures, notably specified complexity and irreducible complexity. There are, of course, implications and consequences for every theory concerning the creation of the biosphere, but these are set aside for now while validity is being considered.

Specified complexity identifies a highly improbable, independently given pattern or specification. To establish it as separate from random events, three questions are posed sequentially in a flow chart termed "The Explanatory Filter". Components identified as such in living organisms are highly specific, information-rich, and mutually interdependent, working together to perform functions. This is also the hallmark of high-tech systems. *Irreducible complexity* is present when all components of a system in a living creature must be in place and functional or it does not work.[3]

On the other hand, proponents of origin by natural causes have a high bar to cross because no experiment has produced life from chemicals, and it has never been observed. Biochemists have not been able to create a single cell or any simple form of life from raw chemicals, but evolutionary biologists remain hopeful for a breakthrough someday. Although Darwin himself speculated on it, evolutionary biologists have outsourced the origin-of-life problem to specialists, and take as a starting point a single self-replicating cell.

Thus Evolution theory need only explain the invention of every type of cell; organ; body plan; nerve, immune, regulatory, nutritional, waste disposal, motive, sensory, cognitive, signaling, reproductive, and recycling system that ever existed in the biosphere through descent with change by natural forces unguided by an intelligence, starting from the postulated primordial cell. If that seems unfair, it is self-imposed.

Before the tools of molecular biology became available, study focused on similarities and differences in the morphology of plants and animals. Progress in molecular biology

allowed the detailed study of biological mechanisms. Growing awareness of the extreme complexity of living things at even the smallest scales led to the formal challenge of Evolution theory by Intelligent Design theory. From this perspective, no amount of time, even billions of years, would produce the biosphere by natural causes alone. For Evolution theory, complexity at the molecular level expands the burden of time needed because the invention of novel features, such as wings or immune systems, and their integration into existing body plans, gene regulatory networks, and functional systems would have taken many steps. Each would require a multitude of random mutations in the right places in the right sequence over enormous periods of time, with the presumption that, given enough time, anything is possible. The brevity of recorded history has not allowed this to be demonstrated empirically, but it appeals to the imagination. The recognition of complexity in a biological organism has not altered the view of Evolution theory advocates that "it evolved". However, complexity has made long ages even more necessary. If millions, tens of millions, hundreds of millions of years were not there, evolution of the biosphere would not be possible.

Long ages are underpinned by long half-life radiometric dating of igneous rocks. For example, the calculated age of the Earth is 4.54 billion years, and the half-life of Uranium-238 is 4.47 billion years so the oldest rocks have about as much radiogenic lead in them as they do U-238. Other long half-life isotopes are Rubidium-87 (49 billion years), Thorium-232 (14 billion years), Potassium-40 (1.28 billion years), and Uranium-235 (704 million years).

Radiometric dating of igneous rocks provides a framework of supposed absolute ages for the geologic column, but hardly any sedimentary rocks in the geologic column can be radiometrically dated. Volcanic products are often not near sites being studied, and the circumstances of igneous intrusion can be uncertain, so at specific locations dated rocks may only bracket approximate time boundaries. Researchers often judge the age of fossils by their position in the geologic column, or date the strata by the fossils they contain.

Critics of long half-life radiometric dating of igneous rocks argue that the 'absolute' dates are erroneous because the assumption of a closed system is unrealistic and open

systems are vulnerable to leaking (including zircons[4,5])[6], and that the assumption that no daughter products are present initially is unverifiable;[6]. They often cite two examples. The first is "dacite collected in 1986 at the extrusion dome of Mount St. Helens (Washington, USA) from 1980-1985 eruptions. The whole rock analysis gives 0.35 Ma age. The analysis on separate crystals gives ages ranging between 0.34 Ma (feldspar) and 2.8 Ma (pyroxene)."[7,6]. "Similar results are obtained from andesite flows originated at Mt Ngauruhoe (New Zealand) in 1954."[8] "The dates range between 0.27 Ma and 3.5 Ma for the andesite." "The explanation is obvious: the measured argon 40 in these contemporary rocks is not the result of radioactive decay of potassium 40 (no time to accumulate Ar40 from K40 decay). Excess argon is present in the crystals". "The argon present in the magma, whatever its origin, can be dissolved in the liquid but also trapped in crystals formed by fractional crystallization and can co-exist with the liquid melt." "Fractional crystallization occurs in silicate rich melts. These crystals do not dissolve again during eruptions and maintain gases trapped in their lattice and/or crystal defects, in particular argon". "The amount of Ar trapped in the lattice depends on the crystal structure".[6]

Yet without any other acceptable measure to contradict it, reliance on radiometric dating continues undiminished. This is fortunate, because a radiometric isotope, Carbon-14, has now been used to date the fossils themselves in Cretaceous and Jurassic strata. Clearly, directly dating fossils provides the most accurate ages for animals and the strata they are buried in because it involves the least assumptions, inference, and interpretation.

Carbon-14 has provided dates for the fossils of mammals from the last ice age. Surprisingly, it has also yielded dates in the range of 23,000 to 39,000 years before present (BP) for dinosaur bones, but the test results were blocked from presentation in conference proceedings by the American Geophysical Union in 2011 and 2012, by the Geological Society of America in 2011 and 2012, and at the 2009 North American Paleontological Convention. The data are presented in tables 1 and 2, and Figure 1.

Discussion

1. Carbon-14 dating of dinosaur bones.

Animals ingest radioactive Carbon-14 by breathing and eating. The Carbon-14 in them at the time of death decays to Nitrogen, with a half-life of 5730 years. Carbon dating measures the ratio of Carbon-14 to stable Carbon-12 to get a radiocarbon date. If Carbon-14 pretreatment could not remove modern carbon before testing, this dating system would be useless. But effective techniques have been developed, and radiocarbon dating has been proven reliable with artifacts and organic remains whose age is known historically.

If true dates are to be determined using Carbon-14, variations in the amounts of carbon isotopes in the atmosphere must be known. Such a record exists. "Lake Suigetsu [in Japan] contains annually laminated sediments that preserve both paleoclimate proxies and terrestrial plant macrofossils that are suitable for radiocarbon dating." Earlier work had matched radiocarbon dates from 0 to 12.2 thousand years before the present, confirmed by comparison with the "tree-ring-derived calibration curve". Hundreds of radiocarbon measurements have now been made "covering the period between 11.2 and 52.8 thousand years before the present tied to a time scale derived from varve counting and temporal constraints from other records." This provides "a comprehensive record of terrestrial radiocarbon to the present limit of the ^{14}C method."[9] Calibration can thus be made for fluctuations in atmospheric abundances of Carbon-14 in the past.

When 'old carbon' from depleted ^{14}C reservoirs such as marine or limestone-based lakes is in the diet of an organism, the radiocarbon age will be too old. For example, at Lake Taupo, New Zealand, volcanic CO_2 is a source of old carbon. Venting in the lake floor "transfers ^{14}C-depleted carbon to lake waters, which aquatic plants fix into the food chain; depleted ^{14}C is shown to then pass on to shellfish, waterfowl, and the Norway rat (Rattus norvegicus)." This " can increase apparent ^{14}C ages by >2000 years."[10] So significant differences in radiocarbon ages between dinosaurs and within a given dinosaur could arise according to their nutritional sources or the condition of the local

atmosphere while they were alive. This carbon cannot be removed by pretreatment, and thus would tend to increase the radiocarbon age.

"Although ancient carbon contaminants are of concern, their presence is virtually insignificant compared with the equivalent proportion of modern contamination. The addition of 10 per cent old carbon to a sample dating to 40,000 BP would yield a date of 40,800 BP, only marginally too old". "Even 20 per cent old carbon contamination would only give an age of 41,600 BP. And these are contamination levels that radiocarbon specialists would consider unusually high. The effect of more recent contamination is dramatically different; add 10 per cent modern carbon to the sample and the age is 18,000 BP. Even 0.5 per cent of modern contamination gives a wholly distorted age (35,600 BP). Therefore, in assessing the reliability of radiocarbon ages from the Palaeolithic, it is usual to consider older ages as being more likely to be closer to the 'true' age than younger ones."[11]

Dr. Alexander Cherkinsky is Senior Research Scientist at the Center for Applied Isotope Studies at the University of Georgia, which operates an Accelerator Mass Spectrometer (AMS) for Carbon-14 dating. Regarding C-14 dating of bone, he wrote,[12]

"Today, most methods of bone preparation for ^{14}C dating are designed to extract and purify (with varying degrees of success) a fraction of the organic residue. In general, the goal of these methods is to isolate collagen or some individual compounds such as protein or amino acids of collagen." "Minerals in bones and teeth usually survive much better than the organic fractions of collagen and lipids. Collagen tends to undergo microbiological decomposition, hydrolysis, dissolution, and denaturation over archaeological and geological timescales, so that only in exceptional conditions, such as burial in permafrost, is collagen found to survive without significant changes into the Pleistocene. The material's survival is usually far shorter for the bones buried in warmer regions. In contrast, the mineral fraction of bones and teeth could be preserved quite well or it could alter and stabilize, thus recording the changes of fossilization."

"Our investigation has shown that the pretreatment of bone with diluted acetic acid following a proscribed technique allows the separation of the bioapatite fraction from diagenetic carbonates."

The procedure treats the cleaned and powdered bone with acetic acid followed by vacuum pumping to remove air and CO2 from micropores, then returns the flask to atmospheric pressure to force fresh acid into the smallest spaces. This is repeated at least 4-5 times, ending with an overnight (20+ hours) reaction.[12]

"We have successfully used this technique to prepare and date samples of bone and of tooth enamel and dentin, with varying degrees of preservation condition". "Burned bone samples are reliable material for ^{14}C analyses. The bioapatite fraction along with the fraction of carbonized collagen may be used for dating with the proper pretreatment".

"Most Holocene samples exhibit reliable ^{14}C ages on the bioapatite fraction. Late Pleistocene samples have shown reliable results even for extremely poorly preserved bone". "It is concluded that the technique can be applied to samples in varying states of preservation and practically over a broad whole range of ^{14}C dating."[12]

Many dinosaur fossils are not petrified. Samples of dinosaur bones were sent to the University of Georgia to be tested for Carbon-14 with the Accelerator Mass Spectrometer in the Center for Applied Isotope Studies where Alexander Cherkinsky works. In accord with common practice, information about the types of animals from which the bone samples were taken was not provided to laboratory personnel to avoid biasing their reports. Dr. Cherkinsky certainly had no idea the samples were from dinosaur bones. Testing was done on 7 clean bioapatite samples, 2 collagen samples, and 2 charred bone samples (Table 1). Radiocarbon dating with AMS is reliable to at least 45,000 BP.

Dinosaur	ID number/(bio=bioapatite; col=collagen; chr=charred)	C-14 Years BP	Date of report	USA State
Acrocanthosaurus	UGAMS-7509a/bio	29,690 ± 90	10/27/2010	TX
Acrocanthosaurus	UGAMS-7509b/chr	30,640 ± 90	10/27/2010	TX
Allosaurus	UGAMS-02947/bio	31,360 ± 100	05/01/2008	CO
Triceratops #1	UGAMS-04973a/bio	24,340 ± 70	10/29/2009	MT
Triceratops #2	UGAMS-03228a/bio	39,230 ± 140	08/27/2008	MT
Triceratops #2	UGAMS-03228b/col	30,110 ± 80	08/27/2008	MT
Hadrosaurus #2	UGAMS-01935/bio	25,670±220	04/10/2007	MT
Hadrosaurus #2	UGAMS-01936/chr	25,170±230	04/10/2007	MT
Hadrosaurus #2	UGAMS-01937/col	23,170±170	04/10/2007	MT
Hadrosaurus #3	UGAMS-9893/bio	37,660±160	11/29/2011	CO
Apatosaurus	UGAMS-9891/bio	38,250±160	11/29/2011	CO

Table 1. Carbon-14 results from the Center for Applied Isotope Studies, University of Georgia.

Several other dinosaur bone samples were also tested for Carbon-14 using Accelerator Mass Spectrometry at Geochron Labs (GX) in Cambridge, Massachusetts, and the University of Arizona (AA) (Table 2). Pretreatment was less thorough than the Cherkinsky method. At all labs, results from collagen and bioapatite diverged.

Dinosaur	ID number/(bio=bioapatite; col=collagen; chr=charred)	C-14 Years B.P.	Date of report	USA State
Acrocanthosaurus	GX-15155-A/bio	25,750 ± 280	06/14/1990	TX
Acrocanthosaurus	AA-5786/bio	23,760 ± 270	10/23/1990	TX
Triceratops #1	GX-32372/col	30,890 ±200	08/25/2006	MT
Hadrosaurus #2	GX-32678/chr	22,990 ±130	04/04/2007	MT

Table 2. Carbon-14 results from Geochron Labs and the University of Arizona.

For comparison, we submitted a sample from a mammoth bone to the Center for Applied Isotope Studies. The result for UGAMS-02684 was 36,700 $\pm$ 210 BP, pmC 1.08 $\pm$ 0.03.

A study of pretreatment strategies endorsed having more than one test done on a sample: "The AMS technique does frequently have some very important advantages when it comes to validating a date, however, and these should be emphasized. First, different chemical fractions can often be extracted from the same sample, and enough

to permit repeat dates to be made if the first measurement is suspect in any way." This approach is "invaluable in increasing confidence in the reliability of a date."[13, page 166] We had two Carbon-14 tests conducted on a sample of bone from the Acrocanthosaurus, and on a sample of bone from Hadrosaurus #2 using the Cherkinsky protocols. The results showed near-concordance (29,690 ± 90/30,640 ± 90 and 25,670 ± 220/25,170 ± 230 respectively).

Figure 1 plots the percent Modern Carbon (pmC) values, from which dates are derived. Results obtained from the same sample are circled. Within each circle, the similarity of results is clear.

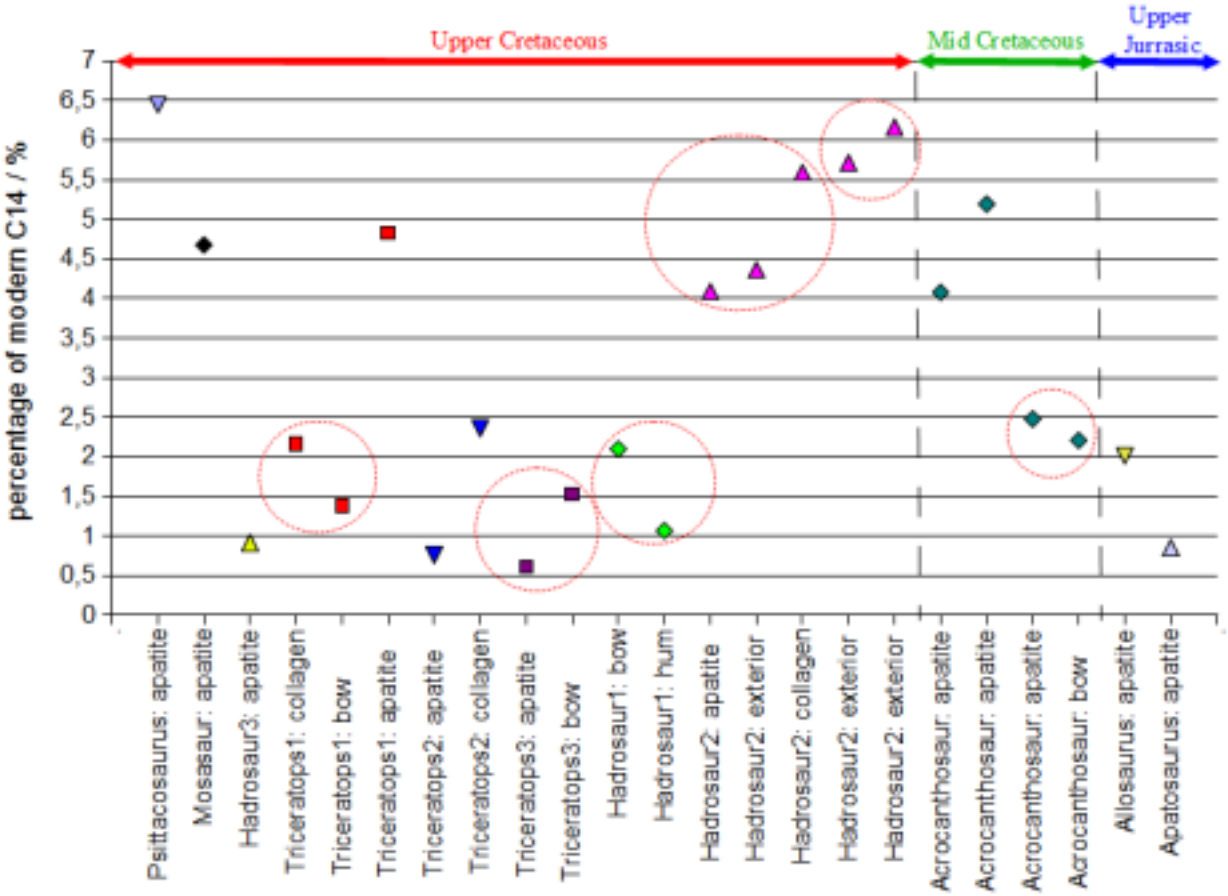

Figure 1. Percent Modern Carbon values for all dinosaur bones tested by the Paleochronology Group. Results obtained from the same sample are circled. Hadrosaur #1, Triceratops #3, and Psittacosaurus are in addition to those shown in Tables 1 and 2. bow = bulk bone; hum = humic

acid (decayed organics in soil). For comparison, the Mosasaur result from Reference 14 is shown (black diamond). Diagram by Thomas Seiler.

The *Paleochronology Group* led by Hugh Miller gathered private funding to pay for these tests.

The Allosaurus and Apatosaurus were found in the Upper Jurassic Morrison Formation. Triceratops #1 and #2, and Hadrosaurus #2 and #3 were found in the Upper Cretaceous Hell Creek Formation. Both are well-known dinosaur graveyards. The Acrocanthosaurus was found in Lower Cretaceous sandstone near Glen Rose, Texas.

In 2011, a Swedish team included a Carbon-14 date of 24,600 BP in their report on a Late Cretaceous Mosasaur.[14] They assumed the Carbon was from microbes, though none were found. The Mosasaur sample was pretreated at Lund Pelletron AMS facility, Lund University, Sweden, and all such labs claim that microbes are removed by pretreatment. Their paper reported finding evidence of collagen and structural proteins, or their breakdown products.

Considering that Carbon-14 dates in the range of 23,000 to 39,000 BP were obtained for every dinosaur skeleton tested, this is likely to be the case for many others as well. Indeed, we have already communicated with two other groups who have had similar results. We encourage the testing of dinosaur bones currently held in repositories. However, their "samples are often preserved using natural and/or synthetic glues. If casein was used for bone preservation, the bone cannot be dated using the collagen fraction, as the glue and collagen have an almost identical organic structure and it is extremely difficult to distinguish these chronologically different organic phases. In such cases, only the bioapatite fraction can be used for ^{14}C dating."[12]

2. Soft tissue in dinosaur bones.

Organic matter decays over time; the question is how fast. In 2002, the estimate for the survival of collagen in well-preserved bone at 0 degrees Centigrade (throughout its entire burial) was 2.7 million years, based on laboratory-measured rates of gelatinization.[15] The situation was similar in 2009: "Current temporal limits for

survival of original biomaterials are based upon theoretical kinetics and laboratory experiments designed to simulate protein diagenesis through exposure to harsh conditions (e.g. low pH and high temperature) and predict complete degradation of measurable biomolecules in well under a million years". "Models of protein degradation extend this to a few million years (at a constant 10 degrees Centigrade)."[16]

These conclusions are interesting because researchers have achieved the "recovery of what appear to be cells, blood vessels and tissues from multiple fossils from varying ages and depositional settings, and protein sequence data from two dinosaurs".[17] Tests with antibodies confirmed that they are original and not microbial biofilms.[18]

In fact, "the occurrence of flexible, fibrous matrix, hollow transparent vessels, osteocytes and intravascular material, often with cell-like morphology, was not isolated, but observed in many specimens of different geological ages (Recent, Pleistocene, Pliocene, Miocene, Cretaceous and Triassic), depositional setting (fluvial sandstone, cave deposits, loess, siltstone, mudstone and marine) and taxonomic affinity (birds, mammals, saurischian (theropod) [(Tyrannosaurus rex)] and ornithischian (hadrosaur, ceratopsian) dinosaurs, and dicynodont)."[19]

A 2013 paper reported finding soft fibrillar bone tissues in a supraorbital horn of Triceratops horridus from the Hell Creek Formation in Montana. It described sheets of soft tissues bearing layers of osteocytes in bone matrix.[20]

Swedish researchers wrote in 2011 about their discovery and confirmation of collagen in a Late Cretaceous Mosasaur: "The preservation of primary soft tissues and biomolecules is not limited to large-sized bones buried in fluvial sandstone environments, but also occurs in relatively small-sized skeletal elements deposited in marine sediments."[14]

In 2013, researchers reported "the discovery of an embryonic dinosaur bone bed from the Lower Jurassic of China, the oldest such occurrence in the fossil record." They estimated the age to be 190-197 million years. The find included "the preservation of numerous disarticulated skeletal elements and eggshells". "This discovery also provides the oldest evidence of *in situ* preservation of complex organic remains in a

terrestrial vertebrate." They were able to "detect the preservation of organic residues, probably direct products of the decay of complex proteins, within both the fast-growing embryonic bone tissue and the margins of the vascular spaces."[21]

An April 26, 2013 press release from Canadian Light Source, Canada's national center for synchrotron research, reported that, "One of the only well preserved dinosaur skin samples ever found is being tested at the Canadian Light Source (CLS) synchrotron to determine skin colour and to explain why the fossilized specimen remained intact after 70-million years." "University of Regina physicist Mauricio Barbi said the hadrosaur, a duck-billed dinosaur from the Late Cretaceous period (100-65 million years ago), was found close to a river bed near Grand Prairie, Alberta." Quoting Barbi, "As we excavated the fossil, I thought that we were looking at a skin impression. Then I noticed a piece came off and I realized this is not ordinary -- this is real skin." "Barbi said this is only the third three-dimensional dinosaur skin specimen ever found worldwide." "Proteins, sugars and fats still found in the skin will create unique vibrational frequencies that scientists can measure" with the CLS in order to determine the original color. "But perhaps the greatest question Barbi is trying to answer at the CLS is how the fossil remained intact for around 70-million years."[22]

In 2011, researchers reported their analysis of organic remnants of reptile skin from Eocene strata, describing "the survival of organic compounds for 50 million years within the Green River Formation" (USA). The fossilized reptile skin "contains a partial remnant of the living organism's original chemistry, in this case derived from proteinaceous skin."[23]

In 2010, researchers reported finding "fossilized musculature from an approximately 18 million year old [(Lower-to-Middle Miocene)] salamander from lacustrine sediments of Ribesalbes, Spain. The muscle is preserved organically, in three dimensions, and with the highest fidelity of morphological preservation yet documented from the fossil record. Preserved ultrastructural details include myofilaments, endomysium, layering within the sarcolemma, and endomysial circulatory vessels infilled with blood. Slight differences between the fossil tissues and their counterparts in extant amphibians reflect limited degradation during fossilization. Our results provide unequivocal evidence that high-

fidelity organic preservation of extremely labile [(decay-prone)] tissues is not only feasible, but likely to be common."[24]

In 2006, researchers reported that "Bone marrow in approximately 10 million year old frogs and salamanders from the Miocene of Libros, Spain, represents the first fossilized example of this extremely decay-prone tissue. The bone marrow, preserved in three dimensions as an organic residue, retains the original texture and red and yellow color of hematopoietic and fatty marrow, respectively; moldic osteoclasts and vascular structures are also present."[25]

In 2013, a mosquito was found in oil shale in the Middle Eocene Kishenehn Formation in northwestern Montana. Its abdomen was engorged with blood. "Iron-stabilized heme", "the oxygen-carrying group of hemoglobin in the host's blood, was identified in the abdomen on the fossil mosquito". "The data reported herein provide incontrovertible documentation of the presence of heme- and arguably hemoglobin- derived porphyrins in a 46-million-year-old compression fossil and localize the porphyrins to a specific anatomical structure within that fossil." This confirms "the preservation of biomolecules through deep time".[26]

In 2012, researchers reported the discovery of eumelanin, a biological pigment derived from the amino acid tyrosine and found in many organisms, in the ink sacs of two Jurassic cephalopods presumed to be over 160 million years old.[27]

In 2013, researchers also reported that "remnants of endogenous eumelanin pigment have been preserved in the feathers" of 3 Achaeopteryx specimens "from the Late Jurassic (150 million years old)".[28]

The search for biomolecules in Mesozoic fossils is in its infancy. It was not even contemplated until recently, due to the assumed incompatibility with the geologic timescale. Dr. Mary H. Schweitzer, who made the most famous discoveries of soft tissue in dinosaurs thus far, was interviewed in 2005: "Scientists never found the tissue before, Schweitzer said, because they did not look. Conventional wisdom told them that organic material must decay within 100,000 years and that fossils are merely minerals that filled in spots where animals were buried."[29]

In order to hold to their paradigm, proponents of Evolution theory must accept that biomolecules can remain intact for as much as 160 million years or more, something they considered ridiculous before it was discovered. They seem to be reluctantly coming to terms with the situation even in the absence of an explanation, illustrating the extraordinary adaptability of Evolution theory. However, with the exception of the Mosasaur report[14], they have chosen not to take the logical next step of testing for Carbon-14. The survival of biomolecules and soft tissue in Jurassic and Cretaceous dinosaur bones is easily explained if they are actually ~31,000 years old as indicated by radiocarbon dates for dinosaur bones.

3. Deposition of multiple sedimentary strata simultaneously.

The geologic column was first assembled as an idealized set of 'systems', recognizable sequences of sedimentary strata. Later, absolute ages were attributed to the geologic column, backed by radioisotope dating of igneous rocks. Most places in the world are missing many of the systems in their local geologic column, and systems may be incomplete.

A geologic 'formation' is a distinctive layer or set of layers in a region, and may cover areas as large as thousands of square miles. Sequence Stratigraphy identifies groups of strata from the same depositional environment, bounded above and below by unconformities. Many of these are attributed to changes in sea level.

The principle of superposition in geology states that each layer of sedimentary rock in an undisturbed sequence was laid down after the one below it, but it does not say how much later. "We cannot accurately gauge time in years from stratigraphy". "Sediments do not accumulate at a constant rate in any sedimentary environment. During a flood, a river may deposit several meters of sand in its channel in just a few days, whereas in the years between floods it will deposit only a few centimeters of sand." "The rate at which sediment is deposited varies widely in different sedimentary environments."[30]

Three sets of observations suggest a new perspective to the formation of the geologic column:

1) Experiments by Guy Berthault that injected crushed sandstone, sand, and other

particles in turbulent water flow produced a series of horizontal laminations simultaneously, contrary to the principle of superposition. "The sand particles deposit according to the velocity of turbulent flow", producing superposed strata. "Turbulence creates graded-bedding layers. When the velocity of the flow increases, it becomes erosive and creates an erosion surface in the deposit." "The flow is the essential agent of stratification".[31]

2) "Fine-grained sedimentary rocks... commonly known as shales or mudstones, are the most abundant sedimentary rock type. They contain the bulk of geologic history recorded in sedimentary rocks, and are a key element in organic-matter burial".

"An enduring notion about deposition of muds has been that they are deposited mainly in quiet environments that are only intermittently disturbed by weak current activity. Flume experiments have shown, however, that muds can be transported and deposited at current velocities that would also transport and deposit sand." "Because mudstones were long thought to record low-energy conditions of offshore and deeper-water environments, our results suggest that published interpretations of ancient mudstone successions and derived paleoceanographic conditions are in need of reevaluation."[32]

3) "Floods with a peak discharge rate greater than 1 million cubic meters per second are termed 'megafloods'." A study of this large-scale flooding[33] identified 41 places on Earth where they have been recorded. "Catastrophic freshwater flooding" is "associated with the termination of the Pleistocene Epoch and the decay of polar and continental ice sheets", "a global phenomenon, with extraordinary spatial extent and repeated frequency".

"The complete vertical lithostratigraphic stack of sediments associated with a given megaflood might be termed a 'succession' and may be of the order of 10s of metres thick." "The unit of investigation at the next lesser scale can be termed a 'sequence' (up to several metres thick) such that several sequences make up the succession." "Sequences are composed of individual beds (centimetres to metres thick) which, if sufficiently thin (e.g. <0.01 m), conveniently can be termed laminae." "Individual beds typically range in thickness from <10 mm to 150 mm."

"Sets of thinner beds may form thicker bed-sets which also fine or coarsen upwards and these thicker beds themselves may form sets within larger-scale fining up sequences. The repetition of the depositional style in the vertical both at the thin bed scale and at the thicker bed-set scale provides strong evidence of rhythmicity in depositional process."

"Although small-scale bedding is usually conformable within sequences, contacts between rhythmic sequences often are unconformable." "Occasional erosional contacts... may indicate short periods of strengthening current." "Each stack of sequences reflects the acceleration and deceleration of a flood wave."

"The successions indicate that flows initially accelerate and then decelerate, with significant shorter period flow pulses also evident in the sedimentary signatures." "At each location, similar sequence stacks are common, leading to the impression of rhythmic deposition from pulsing flow, including from repetitive series of floods."

"The model sequences together represent sustained deposition from high concentrations of sediment". "A common vertical stack of sequences in any one succession consists of: (1) basal, thick, coarse parallel-bedded units, (2) large-scale clinoforms [(sloping beds)], (3) horizontally-bedded thin laminated units, (4) ripple and dune cross-beds, (5) silt-beds, and (6) succession-capping debris flow deposits (in some cases). Such a succession usually is indicative of a single cycle of waxing and waning flood flow, generally dominated by high-concentration suspension deposition onto plane beds." " A key characteristic of megaflood deposits is the apparent massive appearance of single units". "Massive units of coarse sand and granules are common", and "usually consist of individual layers that are amalgamated."

"Individual beds and sets of beds are commonly near-horizontal, planar and laterally extensive. Successions evidently are not channelized and extensivity is indicative of simultaneous and coherent deposition over large areas." "The continuity and extensivity is indicative of simultaneous and coherent deposition over wide areas". "The deposits often are the only record of a flood".[33]

On May 18, 1980 an earthquake triggered an avalanche on the north slope of Mount St. Helens. 2.5 billion cubic meters of rock and ice, lubricated by ice, water, and air, slid down the mountain at over 150 miles per hour. It came to rest 5 miles away. Removal of the north slope led to a steam explosion that flew down the mountainside at 650 miles per hour. "Within the first few hours, snow and ice melted by the intense heat of the blast descended the mountain, sweeping up soil, rocks and trees to form mudflows within 6 major drainage basins surrounding the volcano. On the flank of the volcano, mudflows moved at 90 miles per hour".

"Events at Mount St. Helens produced three significant types of stratification: (1) horizontal lamination, (2) cross-bedding, and (3) graded massive beds." (1) Horizontal lamination (thin stratification) "was produced by particles rolling and bouncing at high speed within gas- or water-charged, low density flows, especially pyroclastic flows." "Varve-like laminae were formed by the multiplied thousands in a span of a few hours." (2) Layers of "sediment with internal, inclined lamination occur[red] in association with both dilute mudflows and lower density pyroclastic flows" moving at moderate speeds, resulting in cross-bedding. (3) There were also "thicker layers of coarser sediment" with "larger particles on the bottom grading into finer particles above. This type of stratification was produced by fast-moving, high-density mudflows and pyroclastic flows." These graded massive beds "accumulated very rapidly as decreasing energy and internal friction suddenly halted movement."[34]

Ash from the eruption of Mount St. Helens covered 22,000 square miles. As dramatic as that is, the ash produced by the first eruption of the Yellowstone supervolcano was 2500 times the volume of the Mount St. Helens ash.[34]

Dinosaurs are buried in geologic formations that cover enormous areas, such as the Morrison Formation of Upper Jurassic sedimentary rock, which covers 600,000 square miles of central North America, the size of Mongolia; the Hell Creek Formation of Upper Cretaceous sedimentary rock, which covers roughly 100,000 square miles of north-central North America; the Horseshoe Canyon and Milk River Formations of the Western Canada Sedimentary Basin that covers 540,000 square miles of southwestern Alberta Province, Canada; the Denver Formation in the Denver Basin that covers

85,000 square miles in eastern Colorado; and the Dinosaur Park Formation in Alberta, Canada, and the Judith River Formation in north-central Montana in the Judith River Group that covers a region of western North America.

A dinosaur would have to be buried quickly in order to be well-preserved. A 6 to 10 foot wide adult would require at least that much sediment covering. Strata covering hundreds of thousands of square miles, standing hundreds of feet thick, containing thousands of bodies of large dinosaurs buried quickly before they could decay, or re-buried from previous inundations, indicate emplacement by moving water on an enormous scale. Experiments have shown the capability of flowing water to deposit multiple strata simultaneously, including shale (mudstone). Megafloods provide real-life examples. This understanding obviates the need for gradual uplift and subsidence of landmasses, rising and falling sea level, to explain the existence of sequences of sedimentary strata. The cause of such massive water waves is beyond the scope of this paper, but clearly they are sufficient to deposit extensive formations and bury dinosaurs.

Conclusion

It is true that our examples of organic remains and carbon-dated fossils cover only part of the geologic column, from the Late Jurassic to the present. Much plant and animal life is thought to have evolved before then. Yet these last 160 million years are supposed to include the evolution of dinosaurs: 10 genera of Ankylosauria, 14 of Carnosauria, 14 of Ceratopsia, 3 of Coelurosauria, 12 of Deinonychosauria, 6 of Ornithomimosauria, 15 of Ornithopoda, 5 of Pachycephalosauria, 4 of Sauropodomorpha, 4 of Stegosauria, and Segnosaurus; 73 genera of Pleistocene megafauna[34] such as mammoths, sabre tooth tigers, giant beavers, cave lions, and giant sloths; over 2,000 bird genera; and modern mammals, such as elephants, anteaters, rabbits, horses, rhinoceroses, bats, pigs, camels, sheep, whales, dolphins, cats, dogs, plus 72 primate genera (including man).

Proponents of Evolution theory have not been forced to take the arguments of Intelligent Design theory seriously because there never were any theoretical limits on the

capability of mutation-natural selection to design organisms. Biologist Franklin Harold wrote in *The Way of the Cell*[36], "There are presently no detailed Darwinian accounts of the evolution of any biological or cellular system, only a variety of wishful speculations." But the many tens of millions of years assigned to the geologic column and the corresponding ages of the fossils in it are a fundamental requirement for Evolution theory. Evidence that multiple sedimentary strata can be, and have been, deposited rapidly and simultaneously removes slow, sequential superposition as a guiding principle in the building of the geologic column; the survival of soft tissue and biomolecules in dinosaurs points to burial less than 3 million years ago; and meticulous testing of dinosaur bones yields radiocarbon dates from 23,000 to 39,000 years before present. Taken together, the physical evidence indicates that fossils in Middle Mesozoic and higher strata were buried less than 40,000 years ago. The host of animals that make their first appearance in the fossil record in these strata could not have evolved in such a short time. Without its required long ages, Evolution theory can be ruled out as an explanation for the creation of all living things, leaving Intelligent Design by eliminative induction.

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