Pioneering ^{14}C Dating of Wyoming Amber and Its Implications for a Young Earth and Global Catastrophism

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Abstract

The geologic column not only has a problem with coal containing anomalously large amounts of ^{14}C, but also with ^{14}C in dinosaur bones, carbonized wood and amber as well. The purpose of this paper is to 1) review radiocarbon dating of carbonized wood and dinosaur bones, 2) introduce radiocarbon and infrared studies of amber, and 3) correlate radiocarbon dates of ambers and other natural resins with real time. This is the first known instance of "true amber" being directly dated. ^{14}C dates for amber were at the upper limit of the AMS dating method. The Hanson Ranch amber buried with a triceratops is slightly younger than Baltic amber used as controls, but all true ambers are about the same radiocarbon age as the coals used as blanks. Dinosaur bones and carbonized wood were all within the range of both the conventional and AMS methods. The primary chemical in the Hanson Ranch amber is succinic acid and its salts, succinates and succinites the same as Baltic amber, based on infrared studies. The dinosaurs and amber on the Hanson ranch appear to have been deposited catastrophically.

Introduction

Radiocarbon (RC) dates have been measured for many kinds of specimens that were previously thought to be too ancient to contain detectable levels of Carbon-14 (^{14}C). Coal specimens are typically 40,000 RC years before the present (BP) (Rotta, 2004), as is carbonized wood (Fields et al., 1990). Dinosaur bone apatite for five different dinosaurs from the western United States were in the range of 9,890 to >36,500 RC years (Fields et al. 1990; Dahmer et al., 1990). Diamond is at <58,000 RC years (Baumgardner et al., 2003). Fossilized wood in ancient sandstone (allegedly 225-230 M years) gave an RC date of 33,720 (±430) RC years BP (Snelling, 1999).

These anomalous ^{14}C readings obviously contradict currently accepted geologic thinking concerning the age of the specimens tested. These measurements, coupled with additional contradictory observations, create a serious challenge for the standard geologic model.

Contemporary geological thought faces a period of crisis not unlike that in physics around the turn of the twentieth century. At that time, anomalies in the measurements of the advance of the perihelion of the planet Mercury caused astronomers to predict the existence of an undiscovered planet somewhere between Mercury and Venus, tugging on Mercury. The predicted planet was named Vulcan. In addition, a very famous set of experiments by Michaelson and Morley using light beams failed to measure the Earth's speed through a

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hypothetical ether that was thought to fill empty space. And the final anomalous set of observations from this time also concerned the nature of light, definitely contradicting the accepted wave theory of light. All three of these insurmountable problems were solved by a single brilliant scientist—Albert Einstein. Einstein demonstrated that the old theories of light, gravity, space, and time were inadequate and had to be replaced by new theories that could naturally explain the anomalous observations. These new theories are quantum mechanics, and the special and general theories of relativity.

A similar crisis exists in the standard geologic model today, where anomalous dates and other geologic observations cry out for a new model to accurately explain them. True science seeks an understanding of all the facts gleaned from observation, and not just those most compatible with a specific theory. It also accepts proven anomalies as a sign that the current theory is inadequate. The discovery of anomalies is an integral part of the nature of knowledge, and therefore the replacement of older theories by newer and more encompassing theories is what makes science function, and denying the existence of valid anomalous measurements and observations is simply impeding science.

The authors were privileged to have worked with the July 5–14, 1996, dinosaur excavation team in Wyoming during and after the excavations. We evaluated and photographed many of the amber specimens, and assisted scientists associated with the Polish Academy of Sciences with our reports, photo-macrographs of amber, references and selected Hanson Ranch samples of amber for RC dating.

Why Radiocarbon Date Amber?

An unexpected RC date of 12,800 years before the present (BP) was obtained for "a burnt branch" imbedded in the Cretaceous rock strata at the bottom of the Paluxy River, Texas (Beierle, 1979). This suggested that the specimen appeared to be 10,000 times younger than its date in the accepted geologic column of 108 million years BP. Therefore, we determined to test the validity of the controversial theory of the coexistence of humans and dinosaurs by RC dating. Measuring a relatively young date for amber would support the possibility of correspondingly younger dates for dinosaurs and accepted geologic ages in general. If these younger ages were indeed accurate, then confirming human and dinosaur footprints together in the fossil record would be a monumental scientific breakthrough (Morris, 1980), offering still more evidence of our young-earth hypothesis. This controversy was thus at the forefront of the origins debate in the late 1970s and 1980s.

Confirming that fossils containing carbon, including amber, also contain measurable ^{14}C would be consistent with the claim that dinosaurs and man did indeed coexist (even without finding their footprints together in the same strata). It would also show that the Glen Rose Cretaceous strata (also called the "Austin Chalk") were deposited only thousands of years ago. The implications would present a serious challenge to the viewpoint of long ages for Earth's history. It would mean that the alleged 65 million years of evolution since the time of the dinosaur never existed, and the long-age geologic column would indeed collapse. Thus, a straightforward way to settle the controversy was to accelerate all the relevant research. This would include the fields of paleoarchaeology and radiometric dating.

Regarding paleoarchaeology, beginning in 1982, some of us participated in excavations on the ledges of the famous Paluxy River in Glen Rose Texas. These excavations were initiated by Carl Baugh of the Creation Evidences Museum (CEM) after permission was granted by the McFall Ranch family to excavate on their Paluxy River ledges (Baugh and Wilson, 1991) rather than continuing research on the river bottom (Morris, 1980).

The first task we undertook was to evaluate a human handprint impression imbedded in the cretaceous limestone excavated in 1982 (Baugh and Wilson, 1991). Its features were identical to the modern human hand, and were associated with a trail of four, 16-inch-long human-like footprints. The project director of this independent study, a Ph.D. in geophysics, wrote a paper that was presented at the First International Conference on Creationism (ICC) (DeVilbiss, 1986). A group of eight independent researchers (Fields et al., 1990) presented a follow-up paper at the Second ICC. Since the publication of these two Proceedings papers, two more human-like footprint trails have been discovered. One trail has an impressive nine-inch-long human-like footprint in the bottom of an eroded 17-inch-long dinosaur print. The human-like print was the missing fourth print in a trail of five that was part of an original shallow series excavated in 1982. The clay at the bottom of the dinosaur print had not been completely removed in 1982, as discovered in 1997 by a CEM team member. Finally, the footprint combination was extracted from the rock with the landowner's permission and can be seen at CEM.

Prior to the above research, the famous Taylor trail of human-like and dinosaur-like prints together in the Paluxy River bottom had been observed (Morris, 1980). The different interpretations by various parties were the primary cause of the controversy, not the existence of pristine ones found in subsequent years on the McFall ledge (~90 human-like and 300 dinosaur prints). The latter were excavated under tons of Cretaceous limestone and several inches of clay, five strata above the river bottom

(Baugh and Wilson, 1991; Helfinstine and Roth, 1994).

In addition, another major discovery in the Paluxy River was a trail of 136 dinosaur footprints thought to be that of the *Acrocanthosaurus* (Patton, 2000). This should be of great interest to all ichnologists (scientists who study track or footprint remains of extinct plants or animals), and those hungry for dinosaur lore. These prints were rediscovered during a draught in 2000 by a geologist directing the research at that time. This trail was named the Turnage Patton Trail. Patton (2000) describes the trail on his web site, and the *CRSQ* reader is encouraged to examine the footprint trail photos of both species.

> The prints are deep and incredibly detailed. The work of uncovering and cleaning the trails began September 9th and continued through October 14. It was conducted under the auspices of the Metroplex Institute Of Origin Science and the Creation Evidence Museum. The leading dinosaur track authorities have acknowledged that they know of no other single consecutive dinosaur trails in North America that are this long. Both the length and the beautifully preserved detail certainly make this one of the finest displays of dinosaur tracks in the world. The primary trail is finally obscured at the upper end by erosion for a distance of about thirty feet and then the trail appears again for another twenty-one consecutive tracks, making a total of 157 (Patton, 2000).

Ripple marks in sedimentary rock can be found in the river bottom with the dinosaur and human footprints also (Patton, 2000). All the above information is documented and is presented here to demonstrate the necessity to radiocarbon date as many different fossils as possible, including amber, to determine a more accurate time period when the above species left their "ichnites."

Radiocarbon Dating of Fossils

Since 1978 there have been successful efforts by several teams to RC date fossil materials such as a burnt tree limb imbedded in the cretaceous sedimentary strata of the Paluxy River bottom (Beierle, 1979). Dating of carbonized fossil wood from Paluxy River between the top two strata gave RC ages of 38,000; 39,000 (Morris, 1980); 37,480 (+2950/-2140); and 37,420 (+6120/-3430) for carbonized wood in clay layers, and 45,000 (+5550/-3250) for coalified wood and reeds (Fields et al. 1990) using the conventional method. AMS was used on carbonized wood embedded in the rock itself and only exposed to the atmosphere for one-half hour during break-up of rock. The burning condition of the wood (from lightning, manmade fire, volcanic eruptions or asteroid impaction) found imbedded in the river (Beierle, 1979) could have "fixed" the ^{14}C in the wood while it was still hot and smoldering in limestone and/or clay watery mixture, thus preventing old humic acids and carbonates from the limestone watery mix and Bentonite/Illite clays from "diluting" the ^{14}C content by absorbing into the cellulose structure of the wood. The date for this wood was only 12,800. AMS was also used on carbonized wood embedded in the rock itself and only exposed to the atmosphere for one-half hour while the rock was disrupted, and an age of >49,900 RC years BP was obtained in 2005 from a licensed analytical lab in the United States of America. According to a private communication with Dr. John DeVilbiss (Spring of 1986), examination of the clay between the rock strata indicated an estimated age of >5,000 to < 50,000 years BP.

Carl Baugh dated his *Acrocanthosaurus* bone discovery and he obtained an age of >36,600 RC years. At that time no one had any idea the significance of that data. Thus, to determine the time line when these footprints were impressed in the original limy mud and to perhaps further confirm the coexistence of humans with dinosaurs, dinosaur bone fragments from Texas to Alaska have also been radiocarbon dated with RC ages ranging from 9,980 to >36,500 RC years BP (Fields et al. 1990). If these dates are valid the conclusions become obvious: Man and dinosaurs did indeed live together and the evolutionary geologic column must be a factor of 1000 to 10,000 times younger than currently geological thinking assumes. Indeed, the principles of sedimentology supporting the geologic column have already been strongly challenged by lab and flume studies as Berthault (1994) suggests and which this research seems to confirm. Notably, when AMS was employed to date other *Acrocanthosaurus* bones, much younger RC dates of 23, 760 (±270) and 25,750 (± 280) years were obtained (Dahmer et al. 1990).

Fortunately, our consulting geophysicist in the 1980s (DeVilbiss, 1986) could not find volcanic material to K/Ar date in the clay between rock strata. The existence of such material might have caused some confusion in dating, based on what is now known about problems with long age radiometric dating systems (Miller, 2005). However, according to Dr. John DeVilbiss (private communication, Spring of 1986) an examination of the clay between rock strata by a soil lab gave an estimated age of >5,000 to < 50,000 years BP, as noted earlier. Nonetheless, are these RC dates any more reliable than the long age radiometric dating systems? The diversity of anomalous RC dates found for the fossil wood and dinosaur bones suggests a lack of accuracy in RC dating, and further points to the possibility that no radiometric dating can provide absolute ages (Brown, 1992; Van Oosterwych-Gastuche, 1999).

Because of the challenges put forth by old-earth scientists of differing philosophies on origins, the thought remained that maybe the bone and carbonized wood samples could have been contaminated with modern carbon 14 from the environment. It is logical that contamina-

tion could give rise to a variety of RC dates if the weight of carbon absorbed onto bone surfaces or into bone matrices were 1% or greater (Stafford, 1992). Therefore, our goal was to demonstrate that RC dating of amber from the Cretaceous period might help in grappling with the contamination question. Amber contains about 80% carbon (Rice, 1980).

In our estimation there appeared to be several potential outcomes to this study: 1) Because of amber's high carbon content (80%) there would be far more of a chance of contamination than with dinosaur bones containing 2–5% carbon (Andre Ivanov, 1995, personal communication). If amber specimens were contaminated it would give very young RC dates. 2) On the other hand, there could be less risk of absorption of atmospheric ^{14}C in the amber due to the composition and nature of amber itself. 3) It could also be that contamination is just a "straw man" argument and not a significant problem; evolutionists may simply offer contamination as a simplistic answer to why fossils allegedly 70 million or more years old contain detectable levels of ^{14}C. 4) The anomalous dating problem could actually be that RC dating is based on false assumptions and does not give absolute ages (Brown, 1992; Whitelaw, 1993; Van Oosterwyck-Gaustuche, 1999; Humphreys, 2004).

Thus, amber was thought to be the fossil material best suited to test the contamination theory. The fortuitous finding of amber in Wyoming in 1996 (Ceranowicz et al. 2001) expedited the research, avoiding several of the complications associated with finding, expense, and collecting of useful samples of amber.

Physical and Chemical Characterization of Amber; Locations Worldwide and Geology of the Wyoming and Baltic Sites

Amber is known to have a much higher percentage of carbon than wood. According to the AMS lab, the carbon content was 82–88% based on the observed CO2 pressure (Ceranowicz et al., 2001). Details of amber chemistry can be found in Rice (1980) such as that the material burns with a readily-bright yellow flame; contains 79% carbon, 10.5% hydrogen, and 10.5% oxygen, sometimes traces of sulphur; it decomposes at 250° C, and gives off white fumes and pine odor. (Additional background on amber chemistry and history can be found on various Internet web sites.) On the other hand, ten dinosaur bone fragments from the Carnegie Museum of Natural History in Pittsburgh contained only 2 to 7% carbon based on scrapings of their brown to black surfaces as determined by analysis in a Leco furnace analyzer (Fields et al. 1990; Dahmer et al., 1990). Similar percentages are found in the cross sections of dinosaur bones that were seemingly partially or completely petrified (Andre Ivanov, 1996, personal communication).

Rice's book entitled, *Amber, The Golden Gem of the Ages* (1980) is an excellent source of information regarding the history and/or physical properties of amber. Baltic amber comes from deposits in the coastal regions of the Baltic Sea around Denmark, Sweden, northern Germany, Poland and the Soviet Union. Elsewhere, small quantities of amber or fossil resins have been found in Sicily, Romania, China, Burma, Thailand, Japan, the Soviet Union, Canada, and the United States. Currently, large quantities are being mined in the Dominican Republic (Rice, 1980).

A simple description of amber in its raw state, as we found it in Wyoming, follows:

> It sometimes has a dusty, friable reddish-brown, light brown or grey crust, due to alteration. It is found in variously shaped nodules—. When present in alluvial sand or gravel, amber no longer has the opaque coating and is often rounded into pebbles or grain. (Lyman, 1986, p. 308.)

Amber also floats in salty seawater, which is why for centuries amber has been found along the Baltic Sea shores as undersea currents or other disturbances release them from their underwater burial sites. Other major sources of amber include: Colombia, Dominican Republic, Mexico, South Carolina, New Jersey, and even above the Arctic Circle such as Axel Heiberg Island as well as other lesser sites in the United States and worldwide (Rice, 1980).

Ceranowicz et al (2001) gives more locations. Also, as was found out later in Poland, the triceratops site amber contained succinites based on infrared absorption spectra (Figure 1), which confirmed it was true amber. These are cross-linked carbon bonds and are salts of succinic acid called succinites or succinates.

The smoke of amber is said to be a potent therapeutic agent used through the ages. The basic formula for succinic acid is that of dicarboxylic acid (four carbon atoms). Amber contains 3–8% succinic acid (Rice, 1980).

Amber in a Global and Local Perspective

The Hanson Ranch, Roxson Wyoming is located in eastern Wyoming some 80 miles west of Mount Rushmore, South Dakota, and 15 miles west of Route 85 on Cheyenne River Road. We eventually collected a number of samples under the direction of Joe Taylor of the Mt. Blanco Fossil Museum, Crosbyton Texas, who knew where to find the actual 30-cm-thick "gumbo clay layer" in which "Vinny" the triceratops was uncovered. Joe also helped us gain permission of the Hanson family to pursue this quest, as well as showing us the exact strata in which "Vinny" had been excavated (Derstler, 1994). A photo essay of the Hanson Ranch excavations can also be found in this *CRSQ* issue. In addition, a paper by Holroyd et al. (1996) provides a more complete description of the Hanson Ranch and potential research

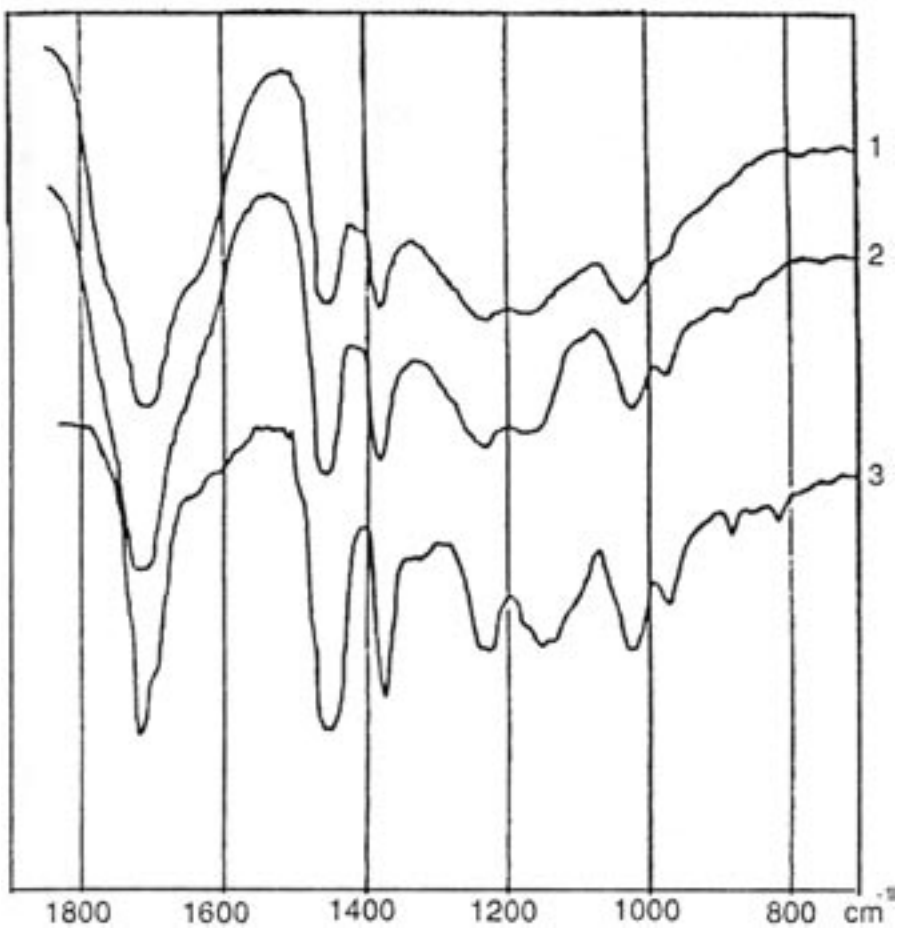

Figure 1. Infrared absorption spectra (IRS) for cedarite samples. 1 – IRS 369, cedarite, Cedar Lake, Cretaceous (MZ, inv. No. 2148, from coll. Of University of Toronto; 2 – IRS 474, cedarite, Grassy Lake, coal mine near the village of Bassano, S. Alberta, Cretaceous (MZ, coll. A. Zobel); 3 – IRS 508, cedarite, collected on July 11th 1996 by Hugh Miller and his team (Paul McDorman, Bryce Gaudian, Matt Miller, Andy Greybeal, and others) at Hanson Ranch, 2360 South Cheyenne River Rd., New Castle, Wyoming, from Upper Cretaceous (upper Maastrichtian) clay (Lance formation). MZ – Museum of the Earth, Polish Academy of Sciences, Warsaw.

ideas. Southwestern Adventist University is now involved in collecting dinosaur specimens from the Hanson Ranch.

Both the hadrosaur and triceratops (three miles away) fossils were buried not in stone but in the dark grey clay (gumbo) of the Lance formation. The clay is called "loam" (Ceranowicz et al., 2001). The paleontologist who originally uncovered "Vinny" in the 1990s, Kraig A. Derstler, is quoted by Ceranowicz (2001) as saying:

> The loam contains muscovite flakes and coalified plant detritus, especially small wood fragments. The minute laminations visible in the loams are underlined by the flatly deposited fragments of coalified remains. This positioning suggests peaceful sedimentation." (p. 77)

However, minute laminations and flatly deposited wood detritus do not necessarily suggest a "peaceful sedimentation." Based on paleohydraulics (Berthault, 1988, 2002a, 2002b, 2004; Clark and Voss, 1994; Fineberg, 1997; Flood, 1981; Julien et al., 1993; Lalomov, 2001; Makse et al., 1997; McKee et al., 1967; Snelling, 1997; Walthur, 1894) minute laminations could suggest deposition in a fast moving current. Mt. St. Helens (WA) is a prime example of rapid deposition of fine laminations. Flat woody material could have been deposited along with the clay and dinosaur bones in a prone position due to the mechanics of rapid deposition. A flume experiment might help settle this minor dispute by adding differently shaped wood chips to a rapid moving clay/water mixture at different hydraulic speeds and studying the alignment of the flat wood chips.

The largest amber museum and amber research center in the world is located in Warsaw, Poland at the "Museum of the Earth." Therefore, we sought the help of Polish scientists who initially used a ^{14}C conventional lab in Poland. However, because of the small size of the Wyoming amber the conventional lab analysis could not date it. Instead, they took samples from the museum in Warsaw and RC dated them with Wyoming amber at an Accelerated Mass Spectrometer (AMS) lab, and wrote an excellent article, which is available from Hugh Miller. This proved to be a difficult analysis as they stated in the monograph, "true amber, succinate, has never been RC dated because it is considered too old for that" (Ceranowicz et al., 2001, p. 77).

They also pointed out in the introduction of the amber paper:

> In order to contrast any possible dating made on the material from Wyoming it was considered necessary to date simultaneously some true amber (succinate) samples from excavations in known geologic deposits, which could perhaps constitute a better blank than the traditional coal samples used in ^{14}C analysis. For this purpose the resins already dated (Table I for "young amber, copal

Table I. Tabulated Radiocarbon Dates for the Three Amber Samples and Previously Dated "Young Ambers," Colophony and Copal,*

Specimen Year dated	Location, Collector	RC Years BP, Equipment	Evolution age, years	Creation age, years
#2961 2001	Saxony, Germany[(b)], Ceranowicz	>49,210 AMS	~40,000,000	~5,350 (± 100) pre-flood
#2962 2001	Sambian Pen. Russia[(c)] Ceranowicz	>51,900 AMS	~ same	ditto
#2963 2001	Wyoming[(d)] USA, Miller Team	>46,450 AMS	~100,000,000	ditto
Previously ^{14}C dated amber type resins from Introduction to the paper*, 1996				
7 Kg"Young amber or Collophony" from Bay of Gdansk, Poland		620 (± 30)	Modern	Post-flood modern
Three "young ambers"		> 60,000	?	~5,350 (± 100) Pre-flood
Copal from Angola		37,700	?	~5,350 (± 100) Pre-flood
Four colophony samples		620–7120	Recent	620–4725 (± 100) Post flood
Scots pine colophony		525	Recent	Post-flood modern

* Ref. Ceranowicz, B.K., Maciej Giertych, and Hugh Miller 2001. Cedarite from Wyoming: infrared and radiocarbon data, *Prace Muxeum Ziemi* 46: 77–80, PL ISSN 0032-6275" [(a)]

[(a)] Barbara Kosmowska-Ceranowicz, Museum of the Earth, Polish Academy of Sciences, Amber Division, Al. Na Skarpie 20/26, 00-488 62-035, Warsaw, Poland
Maciej Giertych, Institute of Dendrology, Polish Academy of Sciences, 62-035 Kornik, Poland. Giertych coauthored the paper with other primary author Ceranowicz and with Hugh Miller, The Paleo Group, Box 2613, Columbus, OH 43216, USA supplying the sample from Wyoming and the major USA references; both English and Polish.

[(b)] Succinate amber from the Museum of the Earth from upper Oligocene/lower Miocene sediments in Goitsche (near Bitterfeld) Germany; collected in 1986.

[(c)] Succinate amber from Museum of the Earth, Warsaw, Poland in Primorskoe Mine, Kalingrad region of Russia in Upper Eocene blue earth sediment (Prussian formation); collected in 1996.

[(d)] A brittle amber-like deposit of fossilized resin embedded in clay from the Hanson Ranch, 2360 South Cheyenne River Rd., New Castle, Wyoming, USA, from Upper Cretaceous (upper Maasstrichtian) clay (Lance formation) July 11th, 1996.

and colophony) were considered too young for comparison and also not referable to any deposit since found on the beach (along the Baltic Sea coast). Thus two excavated samples were obtained from the Museum of the Earth in Warsaw for comparison. The actual results of amber did not help much with the dating of the formation in Wyoming, but since it is the first time amber was tested for RC content it is considered useful to publish the results obtained. (Ceranowicz et al., 2001, p. 77.)

AMS generally requires samples that contain a minimum of 3 mg of carbon. However, it is interesting that when we dated mammoth tusk (to be reported in a future paper), an AMS lab found only 0.2 mg of collagen, yet came up with an RC date of ~ 4,980 RC years BP. This knowledge should be helpful in dating ancient fossil bones.

Peaceful vs. Rapid Deposition of Amber in the Wyoming Dinosaur Graveyards

The last two statements of the paleontologist who originally excavated the Vinny site in 1994 (see previous section) were best challenged by Gary Gordon, formerly of ICR, when he was examining the many small carbonized wood fragments **(see Photo Essay, p. 104, Figure 15)**. During an interview with our videographer, Andy Graybeal, Gary Gordon remarked, "the finely divided chopped-up slivers of coalified wood in the GUMBO matrix speaks of a 1000-mi/hr swirling tidal wave moving across the earth as might have happened during the flood of Noah as the moon's gravity sent these tidal waves moving around the earth for 150 days, twice a day." Fine laminations can form during rapid hydraulic depositions, such as at Mt. St. Helens "miniature Grand Canyon." These laminations deposited rapidly in hours rather than during some

assumed "peaceful sedimentation." Most geologic estimates suggest deposition rates throughout the geologic column at a "rate of one centimeter/1000 years is typical" (Officer, 1996) or as at Sideling Hill Mountain MD Museum Display the estimated rate for the 380 foot road cut is ~ one centimeter/1600 years. (See Internet sites for details of this "Syncline": http://www.dnr.state.md.us/publiclands/western/sidelinghill.html, and http://www.mgs.md.gov/esic/brochures/sideling.html.) Lab and flume studies (Julien et al. 1993; Snelling, 1997) support the proposed catastrophic hydraulic deposition activities that laid down the dinosaur graveyards of Wyoming.

The chopped-up woody material and tiny broken pieces of amber (rarely more than pea-size) are further evidence of rapid hydraulic deposition. Most of the amber particles were much less than ½ cm in diameter and almost always jagged, giving the appearance of having been broken off much larger pieces. Baltic amber did not contain jagged portions and were much larger than Wyoming amber. If Baltic amber did participate in a hydraulic situation, it could be speculated that the event was much less violent than that occurring in Wyoming.

Radiocarbon Dating of Mammoths vs. Dinosaurs

One of Paleo's major projects for 2005 was to collect and study a large number of important RC dates. One such article dealt with the RC ages of Mammoths (Vasil'chuk et al., 1997). Three hundred and sixty RC dates are tabulated based upon ^{14}C dating of bones [~130], tusks & molars [~190], and soft tissue [~40]. On the Eurasian continent the dates ranged from 9,670 (± 60) to >53,170 RC years BP. Except for 21 dates, all were less than 40,000 RC years. Of the dates older than 40,000 RC years, most were in the range of the 43,380 (± 380) years for Prudhoe Bay unfossilized wood buried in permanent permafrost at a 120-foot depth (RC age obtained from a licensed USA ^{14}C lab in 2004). Vasil'chuk et al. (1997) conducted extensive studies of these bones (Permafrost region) but collagen content was not discussed. They also dated plant material found with the bones. They concluded; 1) there was no statistical RC difference between the bones and that of the organic material and 2) dating of mammoth bones is reliable. In addition, Wrangel Island in the Arctic Ocean above Siberia gave eight mammoth bones, tusks, and teeth whose purified collagen was used to obtain RC ages of less than 5,000 years (Vartanyan 1995).

Possible Contamination with Modern RC

The Paleo Group (~1990) RC dated five different collagen-poor dinosaur bone fragments in a similar range of ages (9,890 (± - 50) to 25,750 (± 250) RC years) as RC ages of various mammoths. One licensed AMS lab RC dated the humic and alkaline fractions for a sixth dinosaur bone that was found 20 miles from the Arctic Ocean in Alaska, and obtained 36,140 (±560) and 31,050 (± 230) RC dates respectively (contract with licensed overseas lab in 1998). Even though amber has a large surface area containing high concentrations of carbon (80% carbon), the ^{14}C ages for amber were in the same range as other fossils, including coal. Thus, if carbon compounds had a tendency to pick up modern CO_2 from the air or from organic chemical absorption, the high carbon content of amber would likely make it the best candidate for such absorption. But, there was no indication of such contamination based on the results of ^{14}C dating of amber. Challenges by Stafford (1992) for relatively young dinosaur bone ^{14}C ages therefore seem to be inappropriate arguments for anomalous RC ages for Cretaceous/Jurassic dinosaurs.

These dinosaur bones did not contain collagen, only bone apatite (Dahmer et al.,1990). Bone fragments containing little or no collagen were therefore RC dated. Paleo observed and concluded that:

- Even without bone collagen, dinosaur bones contained residual 2–5% carbon throughout the bone structure (Andre Ivanov, 1996, personal communication) similar to that obtained by surface scrapings (Dahmer et al., 1990). That is sufficient reason to suggest that dinosaur bone apatite is as reliable as dating mammoth bones with or without dating extracted collagen.
- It is well known that carbon can absorb organics, but there is only a limited amount by weight of organic contaminants (gas or liquid) that can be absorbed on the surface of carbon. The time period for this absorption is days, months, or at most a few years depending on the amount of organic contaminants to be removed. However, the time period is not 70 megayears; otherwise there would be little need for activated carbon producing manufacturers. For example, nickel electroplating solutions must be kept pure of organic contamination by continual filtering through filter pumps containing activated carbon. The carbon pack must be changed weekly during high production (Safranek, et al. 1960). It would appear that the bones were not completely petrified and some, like the famous *Acrocanthosaurus* along the Paluxy River, contained kerogenous material in the Haversian canals as observed when sectioned and mounted (Hugh Miller, 1990. Unpublished photomicrograph of cross section of an *Acrocanthosaurus* bone fragment from Creation Evidence Museum,

Glen Rose, Texas). Because of the antibacterial nature of the succinates (succinites) in amber, it is unlikely that ^{14}C atoms would displace carbon atoms from the tightly linked bonds of the succinic acid type molecules anymore than that for diamond (Baumgardner et al., 2003). Since the RC dates were at the upper limit of AMS dating system it is obvious there was no contamination.

- Evolutionists have occasionally suggested that certain microbes may have contaminated the amber (and dinosaur bones) with modern ^{14}C atoms, thereby giving an inappropriately young RC age. However, there is no evidence to suggest that solidified amber can absorb modern ^{14}C in any form, so microbial activity is likely irrelevant to the RC dates obtained. Furthermore, the analytical procedures for testing ^{14}C content in amber involve acid and base treatments that would remove any cellular tissue and microbial waste products observed by the lab (Snelling, 1999). It may also be safe to assume that RC dating of dinosaur bones would not be affected by microbial activity, but some questions still remain. RC dating of collagen from dinosaur bones may be necessary to help address these questions.
- Hydrothermal activity, such as associated with volcanism, is known to cause older RC dates based on absorbing of old carbon containing gases (Van Oosterwych-Gastuche, 1999). Water under high temperature and pressure could cause contamination of plant and animal materials with old carbon in the formative period of burial and fossilization, which then could hypothetically become "fixed." Thus, the true ages of many fossils could be much younger than RC dating suggests. Research is planned to evaluate possible contamination of modern organic materials with old carbon containing materials.
- In the case of textiles, a hydrothermal condition has caused old textiles to appear much younger (Van Oosterwych-Gastuche, 1999).
- We attribute the lack of collagen and soft tissue in dinosaur bones to the hot environment of the western United States. The more northerly the latitude, the more collagen would be expected to be found in bones due to preservation by colder weather or permafrost, as may have been discovered with some mammoths. This concept of organic material preservation in colder climates is consistent with a creation paradigm of flood and ice age and meltdown over only thousands of years (Oard, 2004a,b). The recent discovery of soft tissue in a T-Rex bone is a major age problem for evolutionary biologists and paleontologists (Schweitzer et al., 2005), and ^{14}C dating of this and other fossils may further contradict accepted geologic dates.

Radiocarbon Date for Wyoming Amber within Range of the AMS Detection System?

The article from Poland (Ceranowicz et al., 2001) concluded:

> Sample 3, from Wyoming, is almost significantly different from zero and therefore its upper limit appears to be not very far from the minimal age given. The probability that it is different from zero is of the order of 94% (P = 0.0608) suggesting that the dating of the Lance Formation should be almost within the range of ^{14}C dating. However, the infrared spectrum similarity with other Cretaceous sediments agrees with the placement of Lance Formation in that stratigraphic position. Also since the succinite samples gave a positive FMC reading, had either of them been used as the blank rather than coal (which had 0.0031 FMC) the Wyoming sample would be even less suspect of young age. (p. 80.)

Observations and Conclusions

- Amber specimens from the Wyoming triceratops site are tiny, bubbly, and of differing colors of yellow to red, as if they had experienced very high heat and pressure. Some amber particles are macro-cracked with numerous fractures like brittle chromium deposits on nickel-plated steel or zinc die castings (Safranek, et al. 1960). This indicates that the inherent brittleness of amber was responding to a significant outside force such as temperature and pressure, and fragmented as did the carbonized woody material.
- Much of the amber was red with some ranging from yellow to orange to red across only a few mm on some specimens. This indicates a high rate of oxidation due to a high temperature over a short time period. Description of some amber specimens is consistent with Lyman's (1986) description, "amber sometimes has a dusty, friable reddish-brown, light brown or grey crust, due to alteration" (p. 308).
- Very small sheets of clear or white mica (muscovite) next

to amber, and in the matrix clay of the "Vinny" horizon indicate that mica sheets could have been forcibly separated from their original matrix by tumbling effect with pebbles and rocks in high speed currents of water over long periods of time.

- The original wood, now brittle, cracked, and carbonized could have been subjected to high temperatures and pressures after burial. The small specimens (less than 1 square inch) along with parts of cones were carbonized similar to what can be seen in the clay and rock of the Paluxy River, Texas and in Colorado with dinosaur age fossils. For amber particles to be buried with the triceratops in a saltwater solution they would have to have been buried quickly otherwise, they would have been easily carried away. This strongly suggests a powerful saltwater hydraulic event.
- Even though many RC ages are near the upper detection limit of the AMS system, the fact that there is some ^{14}C in all carbon-containing fossils, but less than that contained in diamond (Baumgardner, 2003), supports the paradigm of a recent worldwide cataclysmic event depositing these fossils.
- Correlation of amber RC dates with real time seems to fit well for real time calculations for other fossils using Brown's (1992) correlation equation and support the contention that radiocarbon dating assumptions are erroneous.
- RC dating is truly "our friend" (Humphreys, 2004) as new data (Snelling, 1999; Wieland, 2003; Baumgardner, 2003) is consistent with RC dates of the 1980's (Fields et al., 1990; Dahmer et al, 1990) as supporting a young earth and catastrophism.
- This study, along with hundreds of other individual studies by different researchers (many of which have appeared in the *CRSQ*), continue to support a needed revision of the standard evolutionary geologic column based on Paleohydraulics, as Berthault (2004b) and others have done with the Tonto Group of the Grand Canyon, Lalomov (2001) in the Crimea, and Morris (1980), Fields et al. (1990), and Baugh and Wilson (1991) along the Paluxy River, Texas.

Proposed Future Research on Amber

We plan to continue RC and infrared studies of resins from various strata worldwide in cooperation with other scientific organizations when funds are available. We hope to organize results based on location in the geologic column. We also plan to perform flume studies using different sizes and shapes of wood chips in a clay media to see how they line up in the subsequent sediments; the results of such studies could guide field workers in the study of paleohydraulics. It is very important to design proper experiments that will determine if old carbon will indeed age modern biotic matter in hydrothermal conditions. An intensive ^{14}C study of deep core samples of organic materials from Prudhoe Bay etc. also needs to be initiated. Hopefully such studies will help science understand the reason for similarities in ^{14}C ages for dinosaurs and mammoths, as well as other fossils like amber and unfossilized wood and when they were deposited. Such intensive research programs will be done in due course only when funds become available.

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