Answers4Seekers: Session #12B (semi-technical)

TOPIC: Age of the Earth Models: Old-Earth, Assumptions, & Weaknesses

1) Overview of Topic – Old Earth Models
2) Worldviews and Interpretations
3) Biblical Creation Sequence
4) Brief Review of the Hierarchy of Evidence (*Optional*)
5) Brief Review of the Physics of Matter & Definitions (*Optional*)
6) Overview of Radiometric Dating Models (*Optional*)
7) Problem-#1: Sometimes Radiometric Dates Are Rejected
8) Problem-#2: Required Assumptions for Radiometric Dating Models
9) Problem-#3: Radiometric Decay-Rates Can Change
10) Problem-#4: Radiometric Models' Age-Dates Can Be Discordant
11) Problem-#5: Radiometric Isochrons Age-Dates Can Be Discordant
12) Problem-#6: Radiocarbon (C14) Age-Dates Can Actually Be Young or Discordant
13) Problem-#7: Radiometric Dates are wrong when we know the Actual Date
14) Answers to Some Secular Challenges
15) Summary
16) Additional Resources

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1) Overview of Topic (Old-Earth Models)

a. **The strongest level of evidence** for any aspect of History is an "observed and recorded account made by a reliable and capable eye-witness and confirmed by their concurrent society."

b. **Recorded history** has only existed for the past 5100 years (and only 3900 years with calendar accuracy). When this is lacking, estimating the age of an event in history can only be pursued through "models with assumptions."

c. **The formation of the earth** is a past event, before any human observation was available to view it and record it, therefore it is not a **historic** event, but a **pre-historic** event. Therefore, all models that estimate the age of the earth are based on a set of required, but unprovable, assumptions that align with the modeler's worldview.

d. **The weaknesses of the "old-Earth" models over "young-Earth" models of equal veracity** is that old-Earth models contain huge durations of time that allow "unknowns" to influence the model, and by definition lack access to a capable and reliable eye-witness observer of past events.

e. **Old-age models are typically based on the assumption of "uniformitarianism";** yet if any catastrophic processes occurred in the past -- for instance, a global flood – those projected age dates would be in complete error (and if corrected, would project a much younger age).

f. **Old-Earth, Big-Bang, and Steady-State adherents are forced to demand ancient ages** when they interpret evidence; to not require an ancient age would be tantamount to rejecting their old-Earth model, thus leaving the young-Earth model as the only option left.

g. **For many who believe that the universe has a Creator who has communicated to mankind through the Bible,** the simple straightforward reading of Genesis Chapters 1 to 7 describes a young age for the Earth (versus an old age).

h. **Age-Dating Models** seek to estimate the age of the earth by various methodologies. In this session "Part 12B" we will review the method of Radiometric age-dating models, their required assumptions, their resulting date-age estimates, some examples of changes in radioisotope decay-rates, and some examples of radiometric age-dating discordances (conflicts).

i. **Radioisotope Decay-Rates** have only been measured and recorded for less than 100 years. Decay rates are proposed as possessing "fixity" regardless of time or environment, but it has been shown that decay-rates can change or be influenced by environments. Therefore, it is not prudent to believe that decay-rates have possessed "impenetrable fixity" over the uniformitarian's proposed deep eons of time.

j. **Radiometric dating** (typically using heavy element radioisotopes) is typically used from a uniformitarian perspective along with 8 unverifiable assumptions, which estimates the age of the earth to be around 4.55 billion years old.

k. **Radiocarbon (C14) dating** promotes a young age for the earth, since detecting any Carbon-14 in an object means the it has to be less than 90,000 years old (or much younger).

l. **Young-age Clocks**: In our last session (#12A), we explored some physical-clocks that projected a young age for the earth, some projecting ages less than 10,000 years old.

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m. Check List of Priority for the Veracity of a Historic Event

#	Priority of Veracity Rules for determining Events in the Past	Yes	No
1	Is one or more Living, Capable, and Reliable Eye-witness available who: a) observed the past event, b) recorded the past event, c) indexed the past event into its place in history, and d) communicated it to others?	[ ]	[ ]
2	Did one or more Historic, Capable, and Reliable Eye-witness observe the event, record the event, and communicate the event unto their then concurrent society?	[ ]	[ ]
3	Was the historic event close in time and not far outside of recorded history?	[ ]	[ ]
4	Are any Assumptions required to be able estimate the past date of the event?	[ ]	[ ]
5	Are <u>many</u> Assumptions required to be able to estimate the past date of the event?	[ ]	[ ]
6	Does the embraced module of estimating the age of a past of a proposed historic event have any independent (non-associated) models that estimate the same time?	[ ]	[ ]

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2) Worldviews and Interpretations of Evidence

- **Presuppositions**: These are our elementary assumptions about life that we develop from our personal experiences and preferences. They are personal values that by definition cannot be verified by procedure in natural science, and to which we protect to the highest degree and are the least negotiable.

- **Interpretations**: Are conclusions we make about evidence as it is viewed in the light of our presuppositions**.**

- **Worldview:** This is our personal network of beliefs that we developed from of our presuppositions and through which we see and interpret the world.

- **Worldview Bias**: Occurs when we subconsciously accept weaker evidence because it agrees with our worldview, but reject stronger evidence because it conflicts with our worldview. This may occur subconsciously.

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3) Biblical Creation Sequence:

a. **The God of the Bible describes one of His attributes as being "almighty" in power:**

b. Revelation 1:8 "I am the Alpha and the Omega," says the Lord God, who is and was and is to come—**the Almighty."** (Greek: Παντοκράτωρ, Pantokratōr)

c. "Παντο-κράτωρ" (Greek): Panto=All, Kratōr = power/might; therefore, PantoKratōr = "all-power." ["all" includes "infinite"]

   i. The Point: If someone was powerful enough to create the universe in 13.79 Billion years, but truly had all-power (i.e., infinite-power), if they wanted to, they could have also easily created the universe in 6 seconds.

   ii. **God states that at the right time, He will again have no problem creating a new Heaven and new Earth (making the Universe new), as the scripture says:**

> *"Since everything will be destroyed in this way, what kind of people ought you to be? You ought to live holy and godly lives as you look forward to the day of God and speed its coming. That day will bring about the destruction of the heavens by fire, and the elements will melt in the heat. But in keeping with His promise we are looking forward to a new heaven and a new earth, where righteousness dwells." (2 Peter 3:11-13)*

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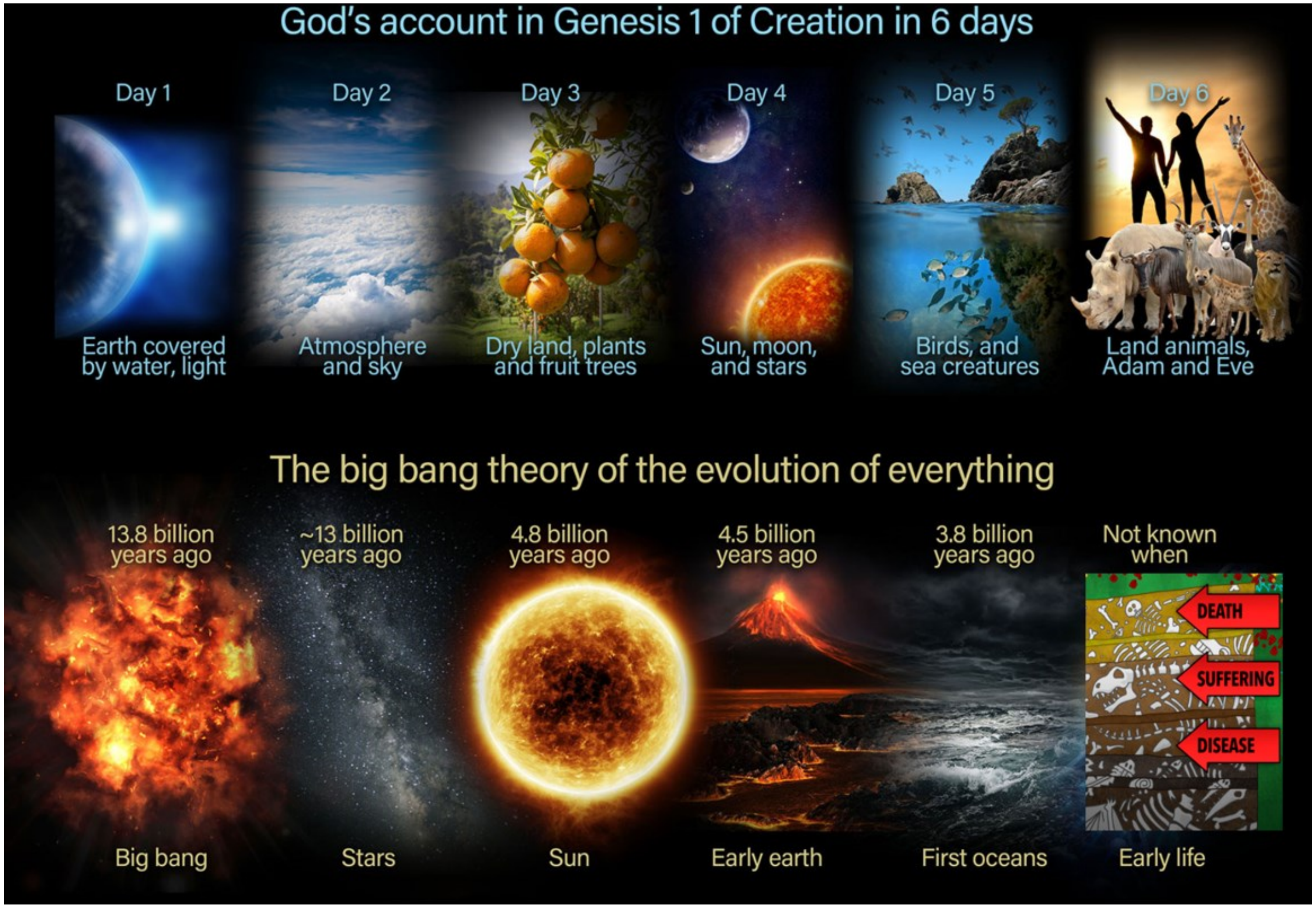
d. The Two Models Have Very Conflicting Chronologies of Key Events:



Note: The Biblical sequence vs. Big-Bang's naturalistic sequence

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4) Brief Review of the Hierarchy of Evidence (Optional)

a. As noted below, an accurate record from a current, reliable, and capable eye-witness is the highest level of evidence.

b. Second to that would be a past accurate record from a current, reliable, and capable eye-witness and confirmed by the concurrent community as accurate.

c. Eye-witness historic records only go back to 5100 BC, everything beyond that is pre-history and there must be delegated to the realm of assumptions and estimates. Additionally, Historical records that have "calendar accuracy" only go back to 1800BC – the most authoritative. (See Session#2 for Review of Types of Evidence)

d. Levels and Types of Historic Evidences

Evidence Level	Evidence Types	Brief Description of Evidence type	Evidence type Example:
Highest	Present Eyewitness	A Living, Present, Capable and Reliable, Eyewitness	A living person who saw and recorded one of the planes crashing into the NYC World Trade Towers on 9-11-2001.
Medium-High	Past Eyewitness	A Record from the Past, by a Capable and Reliable Eyewitness	The signed document called, ***"The Unanimous Declaration of the Thirteen United States of America"*** signed and dated on *7/4/1776.* (note: some absent members signed later).
Medium-Low	Historical Science - Present	Present Phenomenon Observation along with assumptions about the past rates and their conditions.	"For human or animal remains … almost all of the **carbon 14** in a dead organism has already decayed, so researchers must turn to longer-lived elements." https://www.scientificamerican.com/article/how-do-scientists-determine-the-ages-of-human-ancestors-fossilized-dinosaurs-and-other-organisms
Lowest	Historical Past	Past recorded observations along with assumptions about the past rates and their conditions.	The phlogiston theory (1667ad to 1794ad): Is a now discredited scientific theory that postulated the existence of a fire-like element called phlogiston contained within combustible bodies and released during combustion; is now replaced by the "Oxygen Theory."

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e. Hierarchy of General Evidence: *(for more info, Review "evidence" information from Session#2)*

Evidence Priority Levels	Evidence Type & Brief Description
Level 10 (Strongest)	**Origin Observed:** Something originally observed, measurable, repeatable today, and recorded by a credible and capable eye-witness or observer.
Level 9	**Origin Observed:** Something originally observed, repeatable today, and recorded by a credible and capable eye-witness or observer.
Level 8	**Origin Observed** - Something originally observed and recorded by a credible and capable eye-witness or observer.
Level 7	**Origin Not-Observed, But Historic** - Something observed in the past, measured, and recorded by a credible and capable eye-witness and accepted as factual by their contemporary community.
Level 6	**Origin Not-Observed, But Historic** - Something observed in the past, and recorded by a credible and capable eye-witness and accepted as factual by their contemporary community.
Level 5	**Origin Not-Observed, But Historic** - Something observed and historically recorded by a credible and capable eye-witness.
Level 4	**Origin Not-Observed, Based on Calculation Only:** **1)** Based on a present observed phenomenon that is measurable and repeatable, and believed to be understood. **2)** Also, assumptions are required a) Phenomenon interpretation is correct, b) present rate of phenomenon is identifiable and repeatable, c) the rate process has remained uniformitarian throughout its existence, d) the system was and remained an absolutely closed-system, and e) No supernatural involvement. **3)** Additionally, should agree with other competing dating and history evidence methods.
Level 3	**Origin Not-Observed, Based on Calculation Only:** **1)** Based on a present observed phenomenon that is measurable and repeatable, and believed to be understood. **2)** Also, assumptions are required a) Phenomenon interpretation is correct, b) present rate of phenomenon is identifiable and repeatable, c) the rate process has remained uniformitarian throughout its existence, d) the system was and remained an absolutely closed-system, and e) No supernatural involvement.
Level 2	**Origin Not-Observed, Based on Calculation Only:** 1) Based on a present observed phenomenon that is measurable and repeatable, and believed to be understood.
Level-1 (weakest)	**Origin Not-Observed, No Phenomenon Calculation:** Simply proposed by an a-priori commitment to a philosophic worldview.

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f. The Priority of "closeness to the event" (less interference opportunity is better):

i. When two <u>equally</u> viable, but competing age-dating models produce conflicting age estimates for the same object, the one with the closer age-date estimate should be seen as being more accurate, since, theoretically, it had less time for unknown forces or events to interfere, influence, or change the object.

ii. <u>An illustrative allegory</u>:

Person-#A sees through their "age-dating model" that the pond in the distance is <u>1-mile</u> away. Person-#B sees through their "age-dating mode" that the pond is 100 feet away. Whose "model" is more likely to be accurate?

1. The far view (and old age distance) of the Evidence: Real or Mirage?

2. The Closer view (younger age) of the Evidence is typically more accurate.

3. In the previsous Session, #12A, we reviewed Age-Dating models that projected “young age estimates” for the Earth.

5) Brief Review of The Physics of Matter & Definitions (optional)

a. Definitions:

i. **Matter**: Anything that is physical or takes up space.

ii. **Matter** is typically made-up atoms (or their constituent parts)**.**

iii. **Matter** is held together by the four fundamental forces: Gravity, Electro-magnetism, Strong nuclear forces, and Weak nuclear forces.

iv. **Force**: Is a phenomenon that produces a “push or pull effect” that acts upon matter.

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v. **Matter** can be converted to energy and vice versa, as seen by Einstein's formula $E = MC^2$.

vi. **Matter** possesses both particle and wave properties.

vii. **Atoms** are made up of particles called Protons (+ charge), Neutrons (no charge), and Electrons (- charge); electrons orbit the Atom's nucleus.

viii. **Atom's Nucleus**: The center of the atom that contains only protons and neutrons.

ix. **Nucleus' Quarks**: Furthermore, Protons and Neutrons are made from a specific arrangement of three Up and Down Quarks; Quarks are viewed as elementary (fundamental) particles of protons and neutrons.

x. **Charge**: Electric charge is a property of matter that causes it to exert a positive or negative force when placed in an electromagnetic field. Like charges repel (push away) each other and unlike charges attract (pull towards) each other.

xi. **Elements**: Elements are the different types of atoms. There are around 92 naturally occurring elements. Each element is identified by the specific number of protons in its nucleus (center); the number of protons in the atom's nucleus defines its unique physical properties.

xii. **Isotopes**: Isotopes of elements are atoms that have a specific number of protons, but have differing numbers of neutrons.

xiii. **Radioisotopes**: Atoms that have an excess number of neutrons when compared to the number of their protons, and so have some degree of instability. In nature, unstable isotopes seek to become "stable Isotopes," primarily through radiating: 1) a beta particle, 2) an alpha particle, or a photon of gamma ray.

xiv. **Radioisotope Half-Life**: Half-life is the time duration for the current quantity of a specific unstable radioisotope to decay one half of its atoms into a daughter product (based on the radioisotope's current decay-rate).

xv. **Secular:** A perspective that avoids or rejects any supernatural influence or activity within a topic.

xvi. **Uniformitarianism:** A perspective that holds to the concept that all physical processes are fixed and steady throughout time; rejecting the possibility of any catastrophic, accelerated, or supernatural processes or actions.

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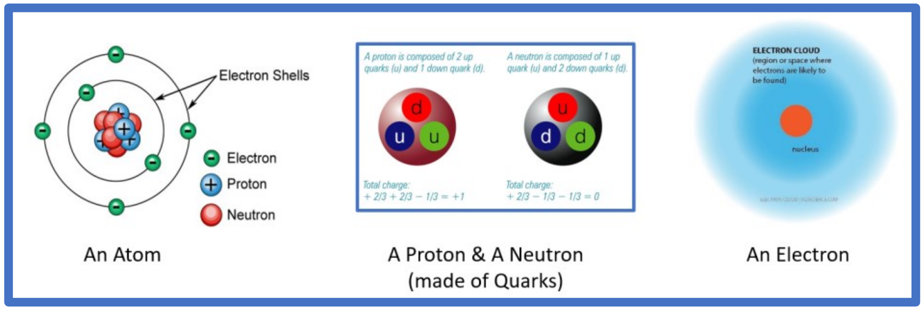
b. Basic view of atomic structure:



An Atom | A Proton & A Neutron (made of Quarks) | An Electron

6) Overview of Radiometric Dating Model Technique (Optional)

a. **Radiometric Dating:** endeavors to estimate the past age of an object based on its current measure radioisotope decay-products and the current decay-rate of that radioisotope:

   i. **Radiocarbon Isotope** (C14) model seeks to estimate the age-date of dead organic material based on the current decay-rate of Carbon14 → Nitrogen14.

   ii. **Radiometric Isotopes** models seek to age-date igneous rock specimens based on the current decay-rate of some Radio-Isotopes into their daughter products. Igneous rocks form from molten rock (magma) under the earth's surface as it cools and solidify or as molten rock materials reaches and cools on earth's surface, called "lava."

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iii. Some Parent Radioisotopes used in Radiometric Dating (and Half-Lives):

Parent nuclide	Daughter nuclide	Decay constant (yr^{-1})	Half-life of Parent Nuclide
^{87}Rb	^{87}Sr	1.402×10^{-11}	49.44 Gyr
^{232}Th	^{208}Pb**	4.9475×10^{-11}	14.01 Gyr
^{40}K	^{40}Ar	5.81×10^{-11}	11.93 Gyr
^{238}U	^{206}Pb**	1.55125×10^{-10}	4.468 Gyr
^{40}K	^{40}Ca	4.962×10^{-10}	1.397 Gyr
^{235}U	^{207}Pb**	9.8485×10^{-10}	0.7038 Gyr
^{234}U	^{230}Th	2.826×10^{-6}	245.25 kyr
^{14}C	^{14}N	1.2097×10^{-4}	5730 yrs

1. Typical Forms of Radiometric Decay in nature:

Decay Type	Radiation Emitted	Generic Equation	Model
Alpha decay	$^{4}_{2}\alpha$	$^{A}_{Z}X \longrightarrow {}^{A-4}_{Z-2}X' + {}^{4}_{2}\alpha$	Parent → Daughter, Alpha Particle
Beta decay	$^{0}_{-1}\beta$	$^{A}_{Z}X \longrightarrow {}_{Z+1}^{A}X' + {}^{0}_{-1}\beta$	Parent → Daughter, Beta Particle
Gamma emission	$^{0}_{0}\gamma$	$^{A}_{Z}X^{*} \xrightarrow{\text{Relaxation}} {}^{A}_{Z}X' + {}^{0}_{0}\gamma$	Parent (excited nuclear state) → Daughter, Gamma ray

2. Radiometric Decay Processes:

Summary of Radioactive Decay Processes			
Type of Radioactive Decay	**Particle Emitted**	**Change in Mass Number**	**Change in Atomic Number**
Alpha Decay	Helium Nuclei	Decreases by 4	Decreases by 2
Beta Decay	Beta Particle	No Change	Increases by 1
Gamma Emission	Energy	No Change	No Change

b. Radioisotope Carbon 14 Age-Dating Model

i. Overview:

The primary source for the creation for carbon-14 (C14) on Earth is the action of cosmic rays (neutrons) hitting Nitrogen (N14) in the Earth's atmosphere. Once an N14 captures a neutron, the N14 is converted to C14. C14 is very rare, with only about 1 carbon-atom in a trillion being carbon C14.

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ii. Radiocarbon (C14) Decay process:

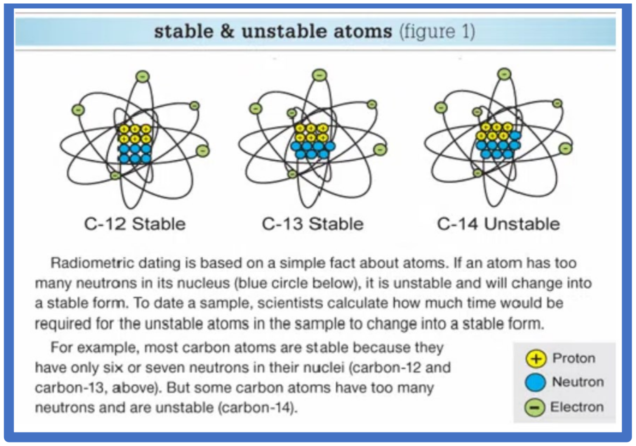
1. Once an atmospheric Nitrogen14 atom is hit by (and captures) a cosmic neutron, it converts to C14 atom by emitting off a proton, lowering its proton count.

2. Carbon-14 is unstable and decays back into Nitrogen14 by emitting a "- Beta particle" (an electron and an electron antineutrino).

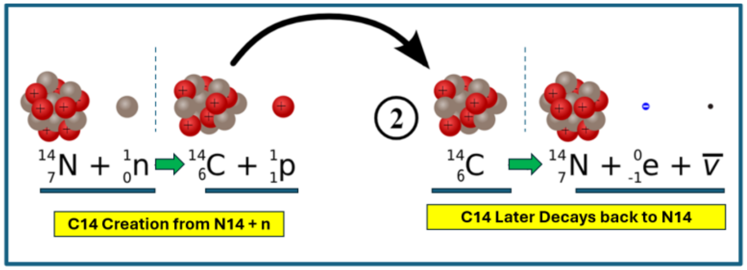
3. The half-life of Radioisotope Carbon-14 is 5,730 years.

iii. Radio-Isotope Carbon Decay Illustrations:

1. Isotopes of carbon:

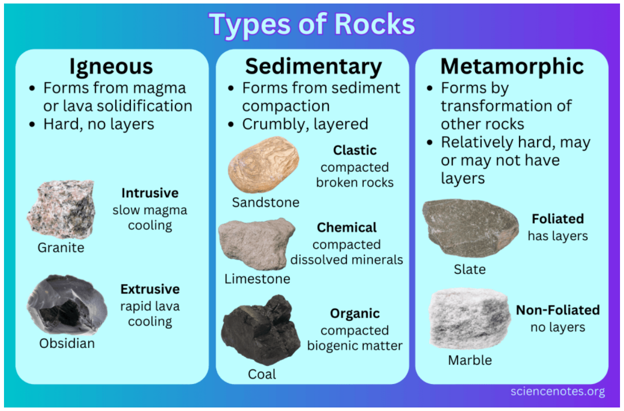


2. C14 Decay process:



c. Heavy-Element Radiometric Dating Models seek to date Igneous Rocks

1. Igneous rocks are those form from the cooling of molten rock material. There are two main sources of igneous rocks: Magma & Lava. Magma exists under Earth's surface and Lava on top Earth's surface. Igneous rock are used for radiometric dating because it is thought that they are more likely to have existed in a "closed system" after their solidification (cooled into a solid), than metamorphic or sedimentary rocks.



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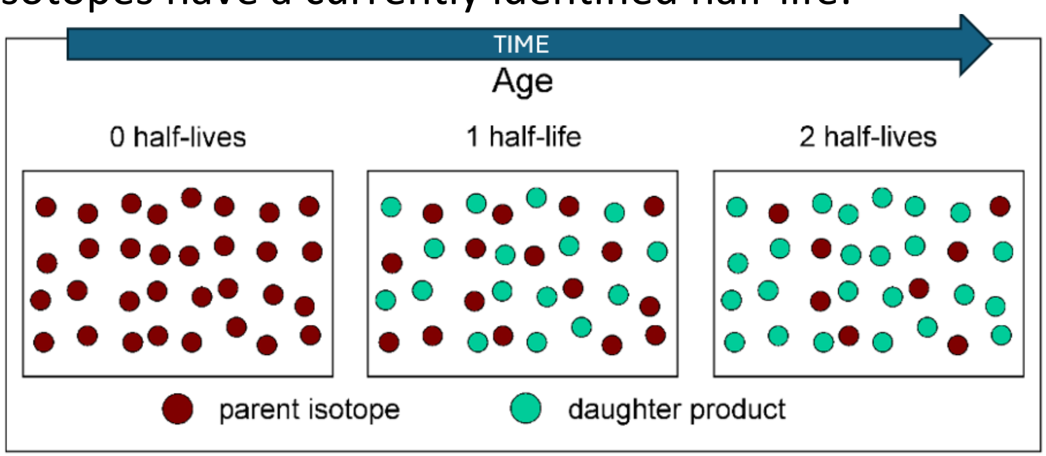
ii. Types of Lava formed materials:

Differences	BASALTIC	ANDESITIC	RHYOLITIC
VISCOSITY	Low ✗	Intermediate	High ✓
TEMPERATURE	1000°C - 1200°C ✓	900°C - 1000°C	750°C - 900°C ✗
GAS CONTENT	1-2 % ✗	3-4 %	4-6 % ✓
SILICA CONENT	About 50 % ✗	About 60 %	About 70 % ✓
EXPLOSIVENESS	Least Explosive	Intermediate	Most Explosive

d. Radiometric Dating Clock Methodology: (general premise)

i. Radioisotopes have a currently identified half-life:



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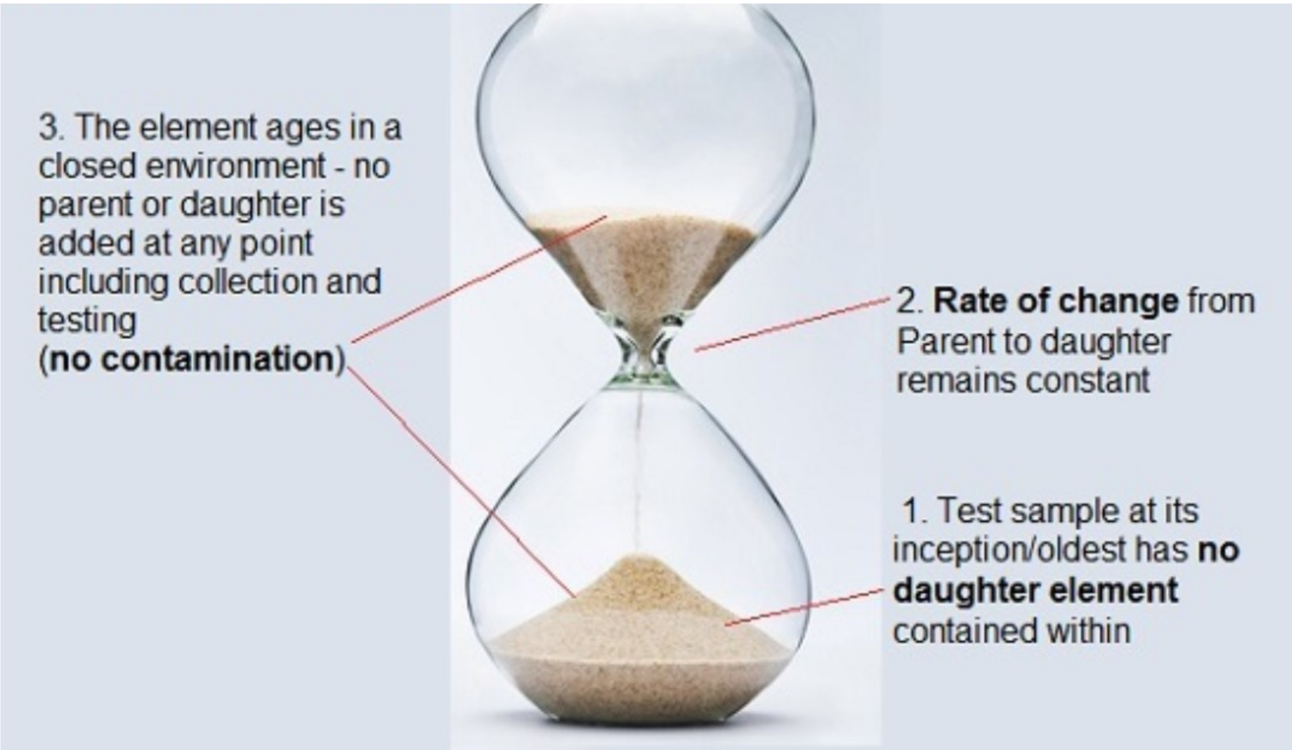
ii. Simplistic Visual of the Radiometric Dating Model

(Please see section-7 for 8 required assumptions in radiometric dating)



Simple Visual of the Radiometric Dating Model

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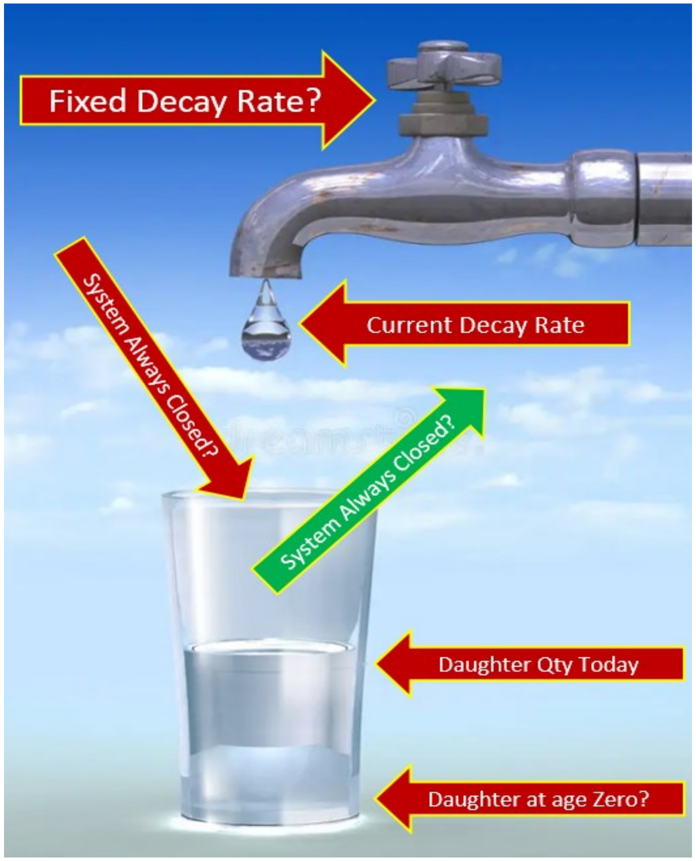
iii. Fuller visual for the required assumptions in the model:



(A total of the 8 required assumptions are addressed in section-7)

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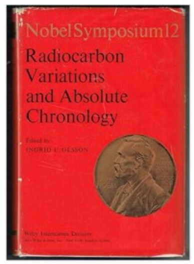
7) Problem-#1: Sometimes Age-Dating Results are Rejected:

a. C14 (Carbon-14)

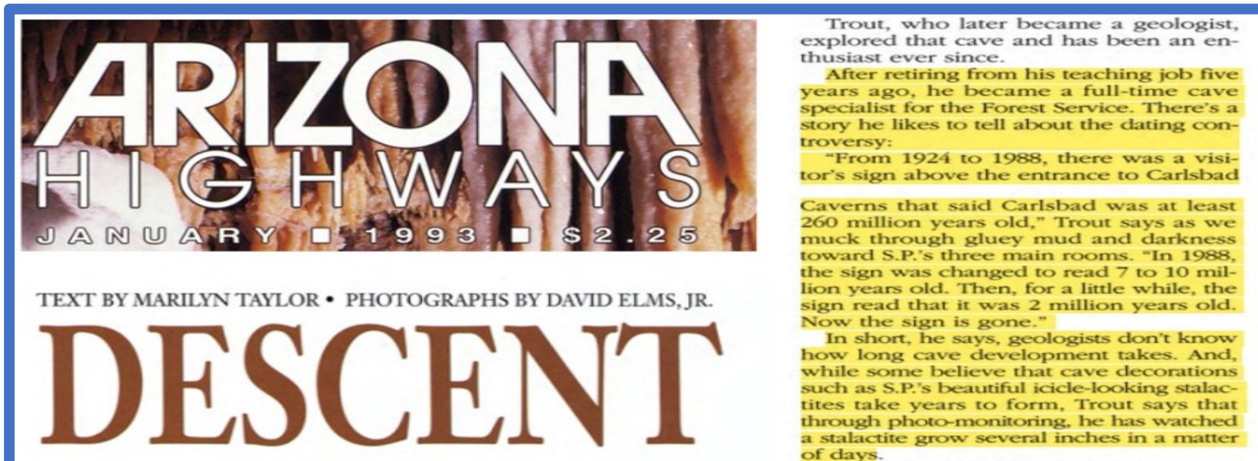


Page 35: **"If a C14 date supports our theories, we put it in the main text. If it does not entirely contradict them, we put it in a foot-note. And if it is completely 'out of date', we just drop it."**

T. Säve-Söderbergh, "C14 Dating and Egyptian Chronology," in ***Radiocarbon Variations and Absolute Chronology***, Proceedings of the Twelfth Nobel Symposium, ed. Ingrid U. Olsson (Stockholm: Almqvist & Wiksell and New York: John Wiley & Sons, 1970), p35.

Reference: [Radiocarbon Variations and Absolute Chronology: Proceedings of the Twelfth Nobel Symposium, Institute of Physics at Uppsala University 1970 (page35)]

b. **Conventional Age-Date (uniformitarian assumptions):** 260 Mya vs. 10 Mya vs. 2 Mya vs. X?



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DESCENT

Trout, who later became a geologist, explored that cave and has been an enthusiast ever since.

After retiring from his teaching job five years ago, he became a full-time cave specialist for the Forest Service. There's a story he likes to tell about the dating controversy:

"From 1924 to 1988, there was a visitor's sign above the entrance to Carlsbad Caverns that said Carlsbad was at least 260 million years old," Trout says as we muck through gluey mud and darkness toward S.P.'s three main rooms. "In 1988, the sign was changed to read 7 to 10 million years old. Then, for a little while, the sign read that it was 2 million years old. Now the sign is gone."

In short, he says, geologists don't know how long cave development takes. And, while some believe that cave decorations such as S.P.'s beautiful icicle-looking stalactites take years to form, Trout says that through photo-monitoring, he has watched a stalactite grow several inches in a matter of days.

LINK: https://azmemory.azlibrary.gov/nodes/download/37283 (page 10-11)

8) Problem-#2: 8 Required Assumptions For Radiometric Dating Models:

1. **Only Naturalistic Uniformitarian Processes Allowed**: Only strictly natural and uniformitarian processes are allowed to be considered; no accelerated, catastrophic, or supernatural processes allowed.
2. **Decay-rates & Ratio-rates Are absolutely Fixed**: The radiometric decay-rate and ratio-rates must have retained absolute "fixity" throughout all time (not just the past 90 years of human monitoring), regardless of environments, time, or influences.
3. **Rock Systems are Completely Closed & Isolated**: The system (e.g., the rock sample) being dated must have remained a closed & isolated system throughout its existence; no other influences allowed.
4. **The Initial Quantities of the Parent & Daughter Products Are Exactly Known**: The initial quantities and ratios of the Parent and Daughter-like radioisotopes that existed within the sample at Time-Zero (solidification) are absolutely known.
5. **All Other Internal Interactions Are Prohibited**: Parent and Daughter quantities are strictly limited to only radiometric decay rate – absolutely no other influences occurred.
6. **Rock System Was Completely Homogenous**: The ratio and distribution of initial Parent isotopes and initial daughter-like isotopes were and remained completely homogenous (evenly distributed throughout the rock sample's solidification formation). No differential mass diffusion— the tendency of different atoms to diffuse through materials at different rates.
7. **Decay Amount is Measurable**: Enough radiometric decay has occurred to allow the Radiogenic daughter-like products to be differentiated and measured.
8. **Discordant Results Are Always Published**: Discordant results of age-dates would always be published for perspective, and would never be discounted or thrown out (ie, rejected and not published).

Video: Why Evolutionary Dating Methods Are Unreliable (16min)

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9) Problem-#3: Radioisotope Decay-Rates Can Change:

a. The belief in the "**absolute fixity**" of Radioisotope decay-rates is a key cornerstone of the radiometric age-dating methodology; yet scientist have observed cases and environments where the decay-rates have changed, up to a trillion times faster.

b. If some unchangeable **decay-rates** have shown that have or could change within the past 90 years monitoring decay-rates, then it would be imprudent to assume decay-rates have always maintained impenetrable and absolute "fixity" over a proposed long eons of time.

c. Prudence calls us to proceed with a level of skepticism in regard to the proposed dates produced by the Radiometric model.

d. Below are 9-examples (based on Science Articles & Studies) showing that radioisotope decay-rates can change as affected by environment or time:

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1. **Secular Physicist confirms that the "fixity" of nuclear decay-rates is "not true anymore."** Physicist Claus Rolfs says he was able to increase the decay-rate of Radium-226, by a 1000 times.

Half-life

www.newscientist.com

FOR ALL its eureka moments, science has taught us many unpalatable lessons about what we are powerless to do. We can't dim the sun to remedy droughts or global warming. We can't stave off the ravages of time to live for thousands of years. And there's little we can do about radioactive waste from nuclear reactors that will be a health hazard for generations to come. Radioactivity cannot be tamed; all we can do is bundle the waste somewhere safe and wait for it to decay away. So it takes some nerve to say otherwise, and suggest that there are, after all, ways to speed up radioactive decay.

Yet that is exactly what Claus Rolfs, a physicist at the Ruhr University in Bochum, Germany, is doing. His dramatic – and controversial – claim is that by encasing certain radioisotopes in metal and chilling them close to absolute zero, it ought to be possible to slash their half-lives from millennia to just a few years. He says it's time to rewrite defeatist textbooks that insist we cannot alter the pace of radioactivity. "When I was studying physics, my teachers said nuclear properties are independent of the environment – you can put nuclei in the oven or the freezer, or any chemical environment, and the nuclear properties will stay the same," says Rolfs. "That is not true any more."

Now his team is starting experiments with alpha decay, which interests Rolfs most of all. That's because his model predicts truly stupendous changes for alpha decay. Take the alpha emitter radium-226, which has a half-life of 1600 years. The model hints that by encasing it in a metal and chilling it to about 4 kelvin, it might be possible to slash its half-life by a factor of 1000, to less than two years. If that turns out to be what happens, it could have huge practical implications.

*Excerpts

2006

Link: 2006, SECULAR, Half-life heresy _ Accelerating radioactive decay _ New Scientist

Answers4Seekers: Session #12B (semi-technical)

2. Uranium-238 (U238) "Half-Life" shows around a 1% reduction over the past 90 years thru direct counting (therefore, some level of decay-rate increase is occurring):

[4.508 Bya → 4.468 Bya]

[**Bya** = Billion Years Ago, **Mya** = Million Years Age, **Kya** = Thousand Years Age]

Page #1 Also, clearly observable trends of decreasing ^{238}U and ^{235}U half-life values were obtained from the direct counting experiments between 1932 and 1974.

Table 2. Determinations of the ^{238}U decay rate expressed in terms of the half-life using direct physical counting experiments, and comparisons of radioisotope ages of terrestrial minerals and rocks.

Year	Half-Life (Byr)	Uncertainty (Byr)	Instrument	Notes	Source
1932	4.508	±0.018	Ion chamber	Grid collimator	Kovarik and Adams (1932)
1935	4.42	±0.03	Ion chamber	Intermediate geometry	Schiedt (1935)
1941	4.514	±0.009	Ion chamber	2π geometry	Curtiss, Stockman, and Brown (1941)
1949	4.511	±0.005	Ion chamber	2π geometry, Natural U	Kienberger (1949)
1949	4.489	±0.010	Ion chamber	2π geometry, ^{238}U	Kienberger (1949)
1955	4.507	±0.009	Ion chamber		Kovarik and Adams (1955)
1957	4.56	±0.03	Ion chamber	2π geometry	Leachman and Schmitt (1957)
1960	4.457	±0.007	Liquid scintillator	4π geometry	Steyn and Strelow (1960)
1971	4.4683	±0.0024	Proportional counter	Intermediate geometry	Jaffey et al. (1971)
1990	4.468	±0.005		Reevaluation of non-neutron nuclear data	Coursol, Lagoutine, and Duchemin (1990)
1994	4.47	±0.020		Reevaluation of measurement data	Duchemin, Coursol, and Bé (1994)
2004	4.468	±0.005	Weighted mean	Critical review of corrected experimental data	Schön, Winkler, and Kutschera (2004)
2004	4.449	±0.017	Mean	Critical review of corrected experimental data	Schön, Winkler, and Kutschera (2004)
2006	4.4712	±0.0031		Geological comparisons	Schoene et al. (2006)
2010	4.4674			Geological comparisons	Mattinson (2010)
2016	4.4683	±0.0096		Critical review of experimental data	Villa et al. (2016)

2017

238u-235u_u-pb_pb-pb_radioisotope_dating_methodologies.pdf (answersresearchjournal.org) (page 17)

Answers4Seekers: Session #12B (semi-technical)

3. Uranium-235 (U235) "Half-Life" shows around a 4% reduction over the past 90 years thru direct counting (therefore, some level of decay-rate increase is occurring):

[713 Mya → 685 Mya]

Page #1

Also, clearly observable trends of decreasing ^{238}U and ^{235}U half-life values were obtained from the direct counting experiments between 1932 and 1974.

Table 3. Determinations of the ^{235}U decay rate expressed in terms of the half-life using direct physical counting experiments, and comparisons of radioisotope ages of terrestrial minerals and rocks.

Year	Half-Life (Myr)	Uncertainty (Myr)	Instrument	Notes	Source
1939	713	±16	Mass spectrometer	Geological comparison using activity ratios of U ores of "known" ages	Nier (1939)
1949	880	±110	Ion chamber	Specific activity by subtracting ion-chamber ^{238}U specific activity	Kienberger (1949)
1950	753	±22	Ion chamber	Specific activity of ^{235}U	Knight (1950)
1951	707	±33	Ion chamber	Measured from activity ratio	Sayag (1951)
1952	713	±16	Ion chamber	Specific activity of ^{235}U	Fleming, Ghiorso, and Cunningham (1952)
1952	710	±16		Correction of Knight (1950)	Fleming, Ghiorso, and Cunningham (1952)
1957	767	±43	Ion chamber	Measured from activity ratio	Clark, Spencer-Palmer, and Woodward (1957)
1957	684	±15	Ion chamber	Measured from activity ratio	Würger, Meyer, and Huber (1957)
1965	692	±9	Si solid state detector	Measured from activity ratio	Deruytter, Schroder, and Moore (1965)
1965	713	±9	Solid state detector	Specific activity of ^{235}U	White, Wall, and Pontet (1965)
1966	708.6	±7.3/2.9	Mass spectrometer	Geological comparison using activity ratios of U-bearing minerals of "known" ages	Banks and Silver (1966)
1971	703.81	±0.48	Proportional counter	Specific activity of ^{235}U	Jaffey et al. (1971)
1974	685	±9	Si solid state detector	^{235}U activity using central state branching ratio	Deruytter and Wegener-Penning (1974)
1993	704	±1	Gas and NaI scintillator	Specific activity of ^{235}U by α-γ conincidence	Bueno and Santos (1993)
2000	703.05			Geological comparisons of zircons <200 Ma	Mattinson (2000)
2003	703.7	±1.1		Critical review—International Union of Pure and Applied Chemistry report	De Laeter et al. (2003)
2004	706	±7	Mean	Critical review of corrected experimental data	Schön, Winkler, and Kutschera (2004)
2004	704	±1	Weighted mean	Critical review of corrected experimental data	Schön, Winkler, and Kutschera (2004)
2006	703.06	±0.04		Geological comparisons (anchored to ^{238}U half-life)	Schoene et al. (2006)
2009	706	±9	Mean	Reevaluation of corrected (Schön, Winkler, and Kutschera 2004) ^{235}U decay data	Xiaolong and Baosong (2009)
2009	704	±1	Weighted mean	Reevaluation of corrected (Schön, Winkler, and Kutschera 2004) ^{235}U decay data	Xiaolong and Baosong (2009)
2010	703.05	±0.58		Geological comparisons (anchored to ^{238}U half-life)	Mattinson (2010)

2017

LINK: 238u-235u_u-pb_pb-pb_radioisotope_dating_methodologies.pdf (answersresearchjournal.org) (page 18)

Answers4Seekers: Session #12B (semi-technical)

4. Solar Flares are shown to affect the decay-rates of the Isotopes of 54Mn & 57Co:

EFFECT OF SOLAR FLARES ON ^{54}Mn AND ^{57}Co RADIOACTIVE DECAY CONSTANTS PERFORMANCE

by

Jonathan WALG [1]**, *Yael PELEG*** [1]**, *Anatoly RODNIANSKI*** [1]**,**
Nir HAZENSHPRUNG [2]**, *and Itzhak ORION*** [1*]

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Scientific paper
https://doi.org/10.2298/NTRP2103219W

Changes in radioactive decay rates due to solar flares have attracted increasing scientific attention in recent decades. In previous studies we demonstrated that solar flares cause changes in the decay rate of ^{241}Am, ^{222}Rn, and ^{232}Th. The change in the count rate of ^{54}Mn due to solar flares, as observed by scholars at Purdue University in 2006, encouraged us to repeat the mea-

2021

LINK: [2021, (SECULAR) "EFFECT OF SOLAR FLARES ON 54Mn AND 57Co RADIOACTIVE DECAY," Walg]

Answers4Seekers: Session #12B (semi-technical)

5. Magnetic storms in space can affect Radioisotopes Decay Rates on Earth:

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OPEN

Fluctuations in measured radioactive decay rates inside a modified Faraday cage: Correlations with space weather

V. Milián-Sánchez[1], F. Scholkmann[2]✉, P. Fernández de Córdoba[3], A. Mocholí-Salcedo[4], F. Mocholí[4], M. E. Iglesias-Martínez[3], J. C. Castro-Palacio[3], V. A. Kolombet[5], V. A. Panchelyuga[5] & G. Verdú[1,6]

For several years, reports have been published about fluctuations in measured radioactive decay time-series and in some instances linked to astrophysical as well as classical environmental influences. Anomalous behaviors of radioactive decay measurement and measurement of capacitance inside and outside a modified Faraday cage were documented by our group in previous work. In the present report, we present an in-depth analysis of our measurement with regard to possible correlations with space weather, i.e. the geomagnetic activity (GMA) and cosmic-ray activity (CRA). Our analysis revealed that the decay and capacitance time-series are statistically significantly correlated with GMA and CRA when

2020

LINK: (Secular) 2020, [Fluctuations in measured radioactive decay rates inside a modified Faraday cage: Correlations with space weather]

Answers4Seekers: Session #12B (semi-technical)

6. The Rotation of the Sun's core shows it can affect the decay rates of isotopes:

EVIDENCE FOR TIME-VARYING NUCLEAR DECAY DATES: EXPERIMENTAL RESULTS AND THEIR IMPLICATIONS FOR NEW PHYSICS

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Unexplained annual variations in nuclear decay rates have been reported in recent years by a number of groups. We show that data from these experiments exhibit not only variations in time related to Earth-Sun distance, but also periodicities attributable to solar rotation. Additionally, anomalous decay rates coincident in time with a series of solar flares in December 2006 also point to a solar influence on nuclear decay rates. This influence could arise from some flavor of solar neutrinos, or through some other objects we call "neutrellos" which behave in some ways like neutrinos. The indication that neutrinos or neutrellos must interact weakly in the Sun implies that we may be able to use data on time-varying nuclear decay rates to probe the interior of the Sun, a technique which we may call"helioradiology".

2011

LINKS: 2011, [Jenkins, EVIDENCE FOR TIME-VARYING NUCLEAR DECAY DATES, 1106.1470v1]

Answers4Seekers: Session #12B (semi-technical)

2010, Purdue-Stanford team finds radioactive decay rates vary with the sun's rotation

7. Cavitation was shown to Increase the Decay-Rate of Thorium by 10,000X:

Cavitation in fluid mechanics and engineering normally refers to the phenomenon in which the static pressure of a liquid reduces to below the liquid's vapor pressure, leading to the formation of small vapor-filled cavities in the liquid.

Speeding-up Thorium decay

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29 maggio 2018

Sommario

We show that cavitation of a solution of thorium-228 in water induces its transformation at a rate 10^4 times faster than the natural radioactive decay would do. This result agrees with the alteration of the secular equilibrium of thorium-234 obtained by a Russian team via explosion of titanium foils in water and solutions. These evidences further support some preliminary clues for the possibility of piezonuclear reactions (namely nuclear reactions induced by pressure waves) obtained in the last ten years.

2018

Links: 2018, SECULAR, Cardone, Speeding Up Thorium Decay, 10000X, 0710.5177
2010, SECULAR, Cardone, Piezonuclear reactions, Decay 10,000 times faster, 1009.4127 (1)

Answers4Seekers: Session #12B (semi-technical)

8. Bare-nuclei of Re-187 (Ionized Rhenium) was shown to have a decay-rate <u>1-Billion</u> times faster than "neutral" Re-187:

VOLUME 77, NUMBER 26 PHYSICAL REVIEW LETTERS 23 DECEMBER 1996

Observation of Bound-State β^- Decay of Fully Ionized ^{187}Re: ^{187}Re-^{187}Os Cosmochronometry

F. Bosch,[1] T. Faestermann,[2] J. Friese,[2] F. Heine,[2] P. Kienle,[2] E. Wefers,[2] K. Zeitelhack,[2] K. Beckert,[1] B. Franzke,[1] O. Klepper,[1] C. Kozhuharov,[1] G. Menzel,[1] R. Moshammer,[1] F. Nolden,[1] H. Reich,[1] B. Schlitt,[1] M. Steck,[1] T. Stöhlker,[1] T. Winkler,[1] and K. Takahashi[2,3]

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(Received 20 September 1996)

We observed the bound-state β^- decay of fully ionized ^{187}Re nuclei circulating in a storage ring. With two independent methods the time dependent growth of hydrogenlike ^{187}Os ions has been measured and a half-life of 32.9 ± 2.0 yr for bare ^{187}Re nuclei could be determined, to be compared with 42 Gyr for neutral ^{187}Re atoms. With the resulting log ft value of 7.87 ± 0.03 the half-life of ^{187}Re ions in any ionization state can be calculated. Thus one can correct the ^{187}Re-^{187}Os galactic chronometer calibration, by taking account of the β^- decay enhancement in stellar interiors, which will lead to a more accurate estimate of the galactic age. [S0031-9007(96)02008-X]

VOLUME 77, NUMBER 26 PHYSICAL REVIEW LETTERS 23 DECEMBER 1996

because the electronic cloud in osmium is stronger bound by $\Delta B_e^{tot} = B_e^{tot}(Os)$-$B_e^{tot}(Re) = 15.31$ keV [8] than in rhenium. Instead, bare $^{187}Os^{76+}$ can decay by capturing an electron from the continuum, as pointed out by Arnould [9]. Bare $^{187}Re^{75+}$ is, however, unstable against β_b decay with the electron bound in the K shell and with a large Q value of $Q^K_{\beta b} = +72.97$ keV [10]. It was realized by Takahashi, Yokoi, and Arnould [3] that in this situation also the first excited state at 9.75 keV can be fed in a nonunique first forbidden transition with a substantially larger matrix element. The estimated half-life [11] for bare $^{187}Re^{75+}$ of $T_{1/2} = 14$ yr is a billion times shorter than that for neutral ^{187}Re. An experimental confirmation of this large change in the decay probability

care of the transformation from the laboratory system into the rest frame of the rapid ions. λ^{cc}_{Re} and λ^{cc}_{Os} are the loss rates of $^{187}Re^{75+}$ and $^{187}Os^{75+}$, respectively, due to charge changing processes and obtained as described by Jung *et al.* [5]. γ is deduced either from the revolution frequency of the ions and the circumference of the ring (about 108 m), or equivalently from the cooler electron velocity, determined by its acceleration voltage. It has been determined as $\gamma = 1.373(2)$. In order to separate the $^{187}Os^{75+}$ ions from the $^{187}Re^{75+}$ mother nuclei, the bound decay electron was stripped by turning on a gas jet target, which crossed the beam and produced $^{187}Os^{76+}$ ions. Two methods were used to determine the number of $^{187}Os^{76+}$ ions originating from the $^{187}Re^{75+}$ decay

1996

LINK: 1996, Bosch, Re v. Re, Decay Rate 1 billion X faster, Observation of Bound-State beta2

Answers4Seekers: Session #12B (semi-technical)

9. Lutetium-176 half-life and decay-rate (to Hafniun-176) is over <u>1-trillion</u> times faster in a high-temperature stellar environment:

communications physics

ARTICLE

https://doi.org/10.1038/s42005-023-01406-7 OPEN

Check for updates

Half-life of the nuclear cosmochronometer ^{176}Lu measured with a windowless 4π solid angle scintillation detector

Takehito Hayakawa[1,2✉], Toshiyuki Shizuma[1] & Tsuyoshi Iizuka[3]

These are inhomogeneous isotopic abundance distribution of Hf in the early solar system originating from stellar nucleosynthesis[37], secondary Lu/Hf fractionation in parent bodies of meteorites[38,39], and decay acceleration through an isomer with a half-life of 3.7 h where the isomer is excited by cosmic radiations[40,41]. At present, there are the three systematically different values (the dashed-lines in Fig. 2). Furthermore, two evaluated values of $(3.76 \pm 7) \times 10^{10}$ yr[42] and $(3.76 \pm 8) \times 10^{10}$ yr[43] are known, but they have large uncertain-

Billion-Fold Acceleration of Radioactivity Demonstrated in Laboratory

by John Woodmorappe

Originally published in Journal of Creation 15, no 2 (August 2001): 4-6.

"Consider the lutetium-hafnium (^{176}Lu-^{176}Hf) system, which is relatively new, and which is infrequently used by uniformitarian geologists to supposedly date rocks. At very high temperatures, part of the ^{176}Lu decay to ^{176}Hf bypasses the conventional slow route, and goes into an isomeric state which has a half-life of only 3.68 hours. In other words, part of the ^{176}Lu decay experiences an alternative decay mode to ^{176}Hf which represents, in effect, a shortcut that is 14 orders of magnitude faster than the conventional ^{176}Lu decay ($t_{½}$ = 37 Ga)."

Sources:

a. Half-life of the nuclear cosmochronometer ^{176}Lu, Nature, 2023
b. Billion-Fold Acceleration of Radioactivity, AIG, 2001

Answers4Seekers: Session #12B (semi-technical)

10) Problem-#4: Radiometric Models' Have Shown Discordance:

a. **"Date-Age Discordance"** occurs when one or more radiometric methods don't produce similar age-dates for the same rock system (or sample); that is, there is conflict projected ages between the different radiometric models or within the same model:

   i. **Concordant Age**: When Radiometric dating models project the same "age" for the same specimen (within measurement equipment's tolerances).

   ii. **Discordant Age**: When Radiometric dating models don't project the same "age" for the specimen (including the measurement equipment's tolerances).

b. **23% of the 4875 radiometric age-dated specimens listed in the USGS National Geochronological Database showed Age "Discordance."**

   i. If radiometric dating models are 100% accurate, there would be 0% discordance, not 23%.)

   ii. Only 64% (0.64) of the whole USGS Geochronological Database was Concordant.

   iii. Database Scoring:
      1. Full Concordance = 1 (Age-date fit within tolerance zone of each other)
      2. Full Discordance = 0 (no Age-date fit within tolerance zone of the other)

Answers4Seekers: Session #12B (semi-technical)

C. USGS National Geochronological Database [2003 version] – Summary of Database:

Only 64% Concordant

23% Fully Discordant (1135/4875)

Table 1. The distribution of concordance scores for each method, as well as for the whole database. Also includes the average score and the percentage of concordant records.

	Pb-Pb	Rb-Sr	^{235}U- ^{207}Pb	^{238}U- ^{206}Pb	^{232}Th-^{208}Pb	K-Ar	FT	All Methods
Score = 0	708	138	68	55	56	43	108	1135
0 < Score < 0.50	119	84	53	47	41	13	27	638
0.50 ≤ Score < 1	76	73	47	38	37	14	19	509
Score = 1	1228	797	330	347	471	80	150	2593
Total Count	2131	1092	498	487	605	150	304	4875
Average Score	0.62	0.80	0.76	0.80	0.84	0.62	0.56	0.64
% Concordant (Score = 1)	58%	73%	66%	71%	78%	53%	49%	53%

2023

LINK: 2023, HOW OFTEN DO RADIOISOTOPE AGES AGREE, Micah D. Beachy, and Benjamin R. Kinard

Answers4Seekers: Session #12B (semi-technical)

i. Table: Many Age-Dates Discordant when compared to other methods:

Table 3. The percentage of pairs for which the age calculated using one method was greater than the age calculated using another. The method giving the older age is in the left-hand column; the method giving the younger age is along the top. Some pairs gave the same age, and so are not counted as being greater for either method.

Method (greater on left)	Pb-Pb	Rb-Sr	^{235}U- ^{207}Pb	^{238}U- ^{206}Pb	^{232}Th-^{208}Pb	K-Ar	FT
Pb- Pb	X	54.4%	84.7%	83.2%	84.2%	67.1%	54.9%
Rb-Sr	45.6%	X	55.1%	60.3%	55.4%	64.0%	70.8%
^{235}U- ^{207}Pb	14.6%	43.6%	X	85.0%	64.4%	77.5%	85.7%
^{238}U- ^{206}Pb	16.1%	38.1%	9.2%	X	56.0%	71.9%	87.1%
^{232}Th-^{208}Pb	15.4%	44.1%	33.9%	42.6%	X	69.6%	82.4%
K-Ar	32.9%	35.9%	21.7%	28.1%	30.4%	X	72.1%
FT	45.1%	29.2%	14.3%	12.9%	17.7%	26.5%	X

2023

LINK: 2023, HOW OFTEN DO RADIOISOTOPE AGES AGREE, Micah D. Beachy, and Benjamin R. Kinard

ii. Only 34 records included ages using "three or more different radioisotope" methods (where at least two were not U-Th-Pb), and only one of these (2.9%) had full concordance

Table 4. The distribution of concordance scores for each method from the "Three Methods Comparisons" dataset. Also includes the average score and the percentage of concordant records.

	K-Ar	Rb-Sr	^{238}U- ^{206}Pb	^{235}U- ^{207}Pb	Pb-Pb	^{232}Th-^{208}Pb	FT	All Methods
Score = 0	4	3	0	0	1	1	2	1
0 < Score < 0.50	3	1	3	2	3	1	1	23
0.50 ≤ Score < 1	1	1	1	1	0	0	0	10
Score = 1	9	5	5	6	5	2	1	1
Total Count	17	10	9	9	9	4	4	34
Average Score	0.63	0.61	0.73	0.80	0.62	0.60	0.33	0.39
% Concordant (Score = 1)	53%	50%	56%	67%	56%	50%	25%	2.9%

2023

LINK: 2023, HOW OFTEN DO RADIOISOTOPE AGES AGREE, Micah D. Beachy, and Benjamin R. Kinard

Answers4Seekers: Session #12B (semi-technical)

iii. Significant conflicts exist between the Historically Eye-Witness Recorded "Flow-age" dates versus the Radiometric K40-Ar40 Age-Dates:

(Example: Mt. St. Helens, History @ 30 years vs. K-Ar @ 350,000 years)

Compare Flow-Date" to K-Ar "Age (Ka). [Ka = 1000 years]

Table 1. Selected published anomalously old K-Ar dates for historic flows.

Volcano	Flow date vs.	Age (ka)	Reference
Mt St Helens	1986 ↔	350 ±50	Austin (1996)
Mt Erebus	1984	48 ±8	Esser et al. (1997)
Mt Erebus	1984	179 ±16	Esser et al. (1997)
Mt Erebus	1984	50 ±30	Esser et al. (1997)
Mt Erebus	1984	640 ±30	Esser et al. (1997)
Mt Erebus	1984	101 ±16	Esser et al. (1997)
Mt Ngauruhoe	Feb 19 1975	1000 ±200	Snelling (1998)
Kilauea	1972	80 ±240	Ozawa et al. (2006)
Mt Etna	May 1964	700 ±10	Krummenacher (1970)
Mt Stromboli	Sep 23, 1963	2400 ±2000	Krummenacher (1970)
Kilauea Iki	1959	8500 ±6800	Krummenacher (1970)
Mt Ngauruhoe	Jul 14, 1954	1000 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 30, 1954	3500 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 30, 1954	1200 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 4, 1954	1500 ±100	Snelling (1998)
Mt Ngauruhoe	Feb 11, 1949	1000 ±200	Snelling (1998)
Mt Lassen	1915	110 ±30	Dalrymple (1969)
Novarupta	1912	2360 ±50	Shormann (2013)

Table 1. Selected published anomalously old K-Ar dates for historic flows.

Volcano	Flow date vs.	Age (ka)	Reference
Hualalai	1801 ↔	80 ±70	Ozawa et al. (2006)
Hualalai	1801	390 ±30	Ozawa et al. (2006)
Hualalai	1800–1801	300 ±40	Ozawa et al. (2006)
Hualalai	1800–1801	540 ±50	Ozawa et al. (2006)
Hualalai	1800–1801	1410 ±80	Dalrymple (1969)
Hualalai	1800–1801	1600 ±160	Dalrymple (1969)
Hualalai	1800–1801	22800 ±16500	Krummenacher (1970)
Kilauea	> 1800	12000 ±2000	Noble and Naughton (1968)
Kilauea	> 1800	21000 ±8000	Noble and Naughton (1968)
Mt Etna	1792	350 ±140	Dalrymple (1969)
Medicine Lake	> 1500	12600 ±4500	Krummenacher (1970)
Rangitoto	> 1300	150 - 470	McDougall et al. (1969)
Sunset Crater	1064–1065	250 ±150	Dalrymple (1969)
Sunset Crater	1064–1065	270 ±90	Dalrymple (1969)
Kilauea	> 1000	42900 ±4200	Dalrymple and Moore (1968)
Kilauea	> 1000	30300 ±3300	Dalrymple and Moore (1968)
Mt Etna	122 BC	250 ±80	Dalrymple (1969)

2023

LINK: 2023, Tapping the Hourglass: Disequilibrium Relaxation Following Accelerated Nuclear Decay Nathan Mogk

Answers4Seekers: Session #12B (semi-technical)

iv. Significant Discordance within the K^{40}-Ar^{40} Dating Method (Wyoming):

Example: 1520 Mya (BT-1QA) vs. 2,620 Mya (BT-1H) -- a 72% error.

Table 3. K-Ar data for the whole rock and selected minerals from the Beartooth andesitic amphibolite, sample BT-1, northwestern Wyoming. (Analyst: Dr. R. Reesman, Geochron Laboratories, Cambridge, Massachusetts.)

Sample	Sample Type	K_2O (wt%)	^{40}K (ppm)	^{40}K (mol/g) $\times 10^{-8}$	$^{40}Ar^*$ (ppm)	$^{40}Ar^*$ (mol/g) $\times 10^{-9}$	$^{40}Ar^*$ (%)	total ^{40}Ar (mol/g) $\times 10^{-9}$	^{36}Ar (mol/g) $\times 10^{-13}$	Model Age (Ma)	Uncertainty (1σ error in Ma)
BT-1WR	whole rock	2.437	2.412	6.036	0.5180	12.96	96.6	13.42	15.57	2011	±45
BT-1QA	plagioclase/ quartz	1.951	1.931	4.832	0.2677	6.699	95.0	7.052	11.95	1520	±31
BT-1B	biotite	6.285	6.223	15.57	1.819	45.52	98.4	46.26	25.04	2403	±53
BT-1H	hornblende	1.305	1.292	3.233	0.4434	11.10	96.7	11.48	12.86	2620	±53

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https://www.icr.org/i/pdf/technical/Do-Radioisotope-Clocks-Need-Repair.pdf (Page 353)

Answers4Seekers: Session #12B (semi-technical)

v. Significant Discordance within the K^{40}-Ar^{40} Dating Method (Grand Canyon):

Example: 656 Mya vs. 1053 Mya, a 60% error:

Table 5. K-Ar data for whole rocks from the Bass Rapids diabase sill, Grand Canyon, northern Arizona. (Analysts: Dr. R. Reesman, Geochron Laboratories, Cambridge, Massachusetts, and Dr. Y. Kapusta, Activation Laboratories, Ancaster, Canada.)

Sample	Rock Type	Position (from top)	K_2O (wt%)	^{40}K (ppm)	^{40}K (mol/g) $\times 10^{-8}$	$^{40}Ar^*$ (ppm)	$^{40}Ar^*$ (mol/g) $\times 10^{-9}$	$^{40}Ar^*$ (%)	total ^{40}Ar (mol/g) $\times 10^{-9}$	^{36}Ar (mol/g) $\times 10^{-13}$	Model Age (Ma)	Uncertainty (1σ error in Ma)
DI-10	Granophyre	2m	8.61	8.527	21.34	0.5737	14.36	96.4	14.90	18.27	895	±20
DI-11	Granophyre	3.8m	8.245	8.166	20.43	0.4206	10.52	94.3	11.16	21.66	721	±14
DI-16	Granophyre	5.5m	5.764	5.706	14.28	0.4281	10.71	92.85	11.53	27.75	974	±20
DI-17	Diabase	7.5m	1.413	1.399	3.501	0.1162	2.908	86.4	3.366	15.50	1053	±24
DI-15	Diabase	21m	2.661	2.634	6.591	0.1211	3.030	86.15	3.517	16.48	656	±15
DI-18	Diabase	29m	1.356	1.342	3.358	0.06572	1.645	76.45	2.152	17.16	692	±14
DI-14	Diabase	49m	0.959	0.950	2.377	0.06567	1.643	76.1	2.159	17.46	914	±22
DI-13	Diabase	59m	0.958	0.948	2.372	0.05014	1.255	83.45	1.504	8.426	737	±18
DI-19	Diabase	71m	0.778	0.770	1.926	0.04973	1.244	75.8	1.641	13.44	866	±24
DI-7	Diabase	73m	0.754	0.747	1.869	0.03893	0.9742	80.0	1.218	8.250	728	±20
DI-22	Diabase	86m	2.157	2.135	5.343	0.11107	2.779	91.21	3.047	9.069	740	±22

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https://www.icr.org/i/pdf/technical/Do-Radioisotope-Clocks-Need-Repair.pdf **(Page 357)**

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vi. Discordance Using Various Radiometric Methods (Beartooth Mountains, Wyoming):

Significant Age Discordances exist between these date-age methods:
K40-Ar40 vs. ***Rb87-Sr87*** vs. ***Sm147-Nd143*** vs. ***Lead-Lead.***   (Models should all produce the similar age-dates)**.**

Example: Discordant Range: 1520Mya vs. 2886Mya: 80% delta in age range

Beartooth Mountains Sample Results

The results show a significant scatter in the ages for the various minerals and also between the isotope methods. In some cases, the whole rock age is greater than the age of the minerals, and for others, the reverse occurs. The potassium-argon mineral results vary between 1,520 and 2,620 million years (a difference of 1,100 million years).

Dating Isotopes	Millions of Years	Type of Data (whole rock or separate mineral within the rock)
Potassium-Argon (single-sample)	1,520	Quartz-plagioclase mineral
	2,011	Whole rock
	2,403	Biotite mineral
	2,620	Hornblende mineral
Rubidium-Strontium (isochron)	2,515	5 minerals
	2,790	Previously published result based on 30 whole rock samples (1982)
Samarium-Neodymium (isochron)	2,886	4 minerals
Lead-Lead (isochron)	2,689	5 minerals

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Link: Does Radiometric Dating Prove the Earth Is Old?

Answers4Seekers: Session #12B (semi-technical)

vii. Discordance Using Various Radiometric Methods (Bass Rapids, Grand Canyon):

Discordant Range: 655Mya vs. 1075Mya: 64% Delta in age range

Bass Rapids Sill Sample Results

Bass Rapids Sill, Grand Canyon: The RATE results differ considerably from the generally accepted age of 1,070 million years. Especially noteworthy is the multiple whole rocks potassium-argon isochron age of 841.5 million years while the samarium-neodymium isochron gives 1,379 million years (a difference of 537.5 million years).

Dating Isotopes	Millions of Years	Type of data (whole rock or separate mineral within the rock)
Potassium-Argon	841.5	11 Whole rock samples
	665 to 1,053	Model ages from single whole rocks
Rubidium-Strontium (isochron)	1,007	Magnetite mineral grains from 7 rock samples
	1,055	11 Whole rock
	1,060	7 Minerals
	1,070	Previously published age based on 5 whole rock samples (1982)
	1,075	12 Minerals
Lead-Lead (isochron)	1,250	11 Whole rock
	1,327	6 Minerals
Samarium-Neodymium (isochron)	1,330	8 minerals
	1,336	Magnetite mineral grains from 7 rock samples
	1,379	6 minerals

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Link: Does Radiometric Dating Prove the Earth Is Old?

Answers4Seekers: Session #12B (semi-technical)

viii. Some Conventional Ages are Discordant with Radiometric Dates:

Compare by Rows: “Conventional Age” vs. “K-Ar Model Ages”:

Table 1. K-Ar model and isochron “ages” obtained for the targeted rock units.

Rock Unit	Location	Conventional Age	Method	Number of Samples	Range of K-Ar Model Ages (Ma)		K-Ar Isochron Age (Ma)
					Minimum	Maximum	
Mt. Ngauruhoe andesites	Mt. Ngauruhoe, New Zealand	Historic flows (1949, 1954, 1975)	Direct observation	11 whole rocks (from 5 flows)	<0.27	3.5±0.2	Not applicable
Toroweap Dam	River Mile 179.4	1.16±0.18 Ma	K-Ar model	whole rock + 3 minerals	1.19±0.18 (whole rock)	20.7±1.3 (olivine)	Not applicable
Massive Diabase Dam	River Mile 202.5 Grand Canyon	0.443±0.041 Ma	K-Ar model	whole rock + olivine	1.4±0.3 (whole rock)	46.5±4.3 (olivine)	Not applicable
Somerset Dam layered mafic intrusion	Somerset Dam, southeast Queensland, Australia	216±4 Ma 225.3±2.3 Ma	K-Ar model composite Rb-Sr isochron	15 (whole rocks)	182.7±9	252.8±9	174±8
Cardenas Basalt	Eastern Grand Canyon, Arizona	1103±66 Ma	Rb-Sr isochron	15 (8 new, 7 existing)	577±12	1013±37	516±30
Bass Rapids diabase sill	Grand Canyon, Arizona	1070±30 Ma	Rb-Sr isochron	11 (whole rocks)	656±15	1053±24	841.5±164
Apache Group basalts	Central Arizona	1100 Ma	Assumed similar to diabase sills	9 (whole rocks)	513±13	968.9±25	Too much scatter
Apache Group diabase sills	Central Arizona	1120±10 Ma 1140±40 Ma	zircon U-Pb biotite K-Ar	21 (whole rocks)	267.5±14	855.8±17	Too much scatter
Brahma amphibolites	Grand Canyon, Arizona	1740–1750 Ma	zircon U-Pb concordia	27 (whole rocks)	405.1±10	2574.2±73	Too much scatter
Beartooth andesitic amphibolite	Northeast Wyoming	2790±35 Ma	Rb-Sr isochron	1 whole rock + 5 minerals	1520±31 (quartz-plag.)	2620±53 (hornblende)	Too much scatter

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**”Conventional age” are those ages being reported in the secular geologic literature.*

Link: https://www.icr.org/i/pdf/technical/Isochron-Discordances.pdf **(Page 411)**

11) Problem-#5: Radiometric "Isochron" Dates Can Also Exhibit Discordance

a. Overview:

i. The isochron models endeavor to reduce the unknowns is a rock specimen:

1. Whether any daughter product exist in the rock when it formed,
2. Whether the specimen remained in a closed system throughout its history,
3. What is the most likely age of the rock, based on statistical averaging of several isotopes' measurement.

Reference: [Thousands not Billions: Challenging the Icon of Evolution, Questioning the Age of the Earth]() **(pg 35 & 36)**

ii. Isochron types:

1. <u>Mineral Isochrons</u>: Measuring several different minerals within a rock sample.

2. <u>Whole Rock Isochrons</u>: Measuring several whole-rock samples from the same rock formation, without separation of any minerals.

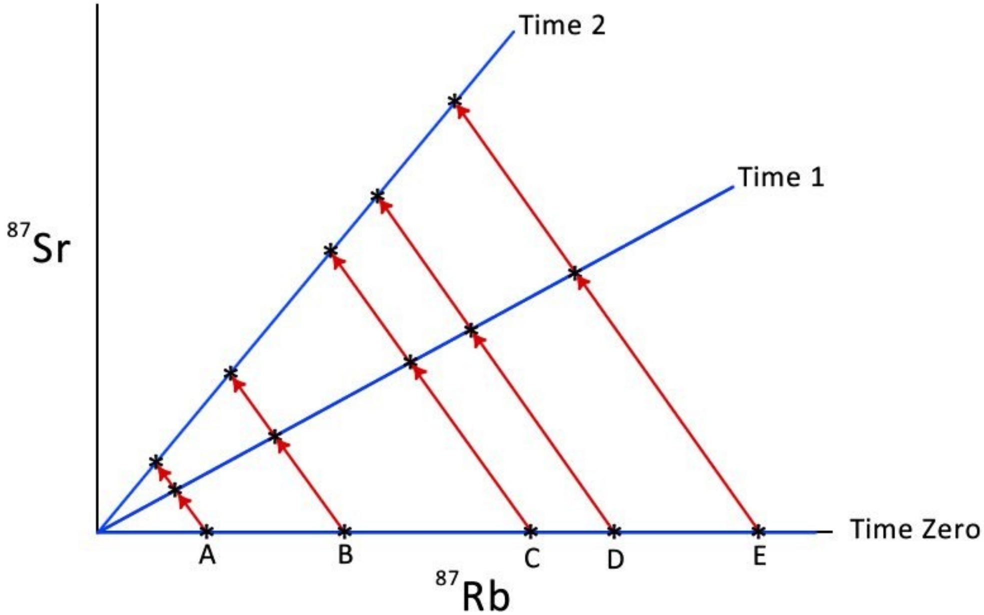
iii. Four Unproveable Assumptions are Required for Isochron Models:

1. The rock specimen/system possesses no <u>contamination</u> or <u>inheritance</u> by the entrance or exit of other materials, completely closed and isolated system.

2. All daughter products are the result only from decay of the identified radioisotope parent and only from within the system.
3. No mixing ever occurred (that is, no magma melted and incorporated other rock into the rock system).
4. Decay rates remain absolutely fixed throughout time and in every environment.

Reference: https://www.amazon.com/Rethinking-Radiometric-Dating-Evidence-Physicist/dp/1946246220, page 54.
Reference: Key Flaw Found in Radioisotope Isochron Dating

iv. Illustration of an Isochron Model:



Answers4Seekers: Session #12B (semi-technical)

v. Isochrons can Produce Fictitious Results due to "Mixing":

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PRINCIPLES OF ISOTOPE GEOLOGY

4 / Fictitious Isochrons

Let us assume that a suite of samples has formed by mixing of two components which have different Rb/Sr and $^{87}Sr/^{86}Sr$ ratios. Such mixtures lie on a straight line connecting the end members in coordinates of the $^{87}Rb/^{86}Sr$ and $^{87}Sr/^{86}Sr$ ratios and thus produce fictitious isochrons whose slopes have no time significance. The slopes of such mixing lines can be either positive or negative depending on the relative values of the $^{87}Rb/^{86}Sr$ and $^{87}Sr/^{86}Sr$ ratios of the end members. The coordinates of points representing mixtures of two components having different concentrations of rubidium and strontium as well as different $^{87}Sr/^{86}Sr$ ratios can be calculated from Equations 9.2 and 9.9. The equation representing two-component

…Zaire, and Rwanda of East Africa. These two volcanic centers are about 100 miles from each other and are located along the western rift north of Lake Tanganyika and west of Lake Victoria. The lava flows are known to be Pliocene to Recent in age and there is evidence of volcanic activity in historical times. These volcanic rocks are therefore very young and should form an isochron having a slope approaching zero. However, Bell and Powell found a significant positive correlation between the average $^{87}Sr/^{86}Sr$ and Rb/Sr ratios of different rock types. Their results have been plotted in Figure 9.4 in coordinates of $^{87}Sr/^{86}Sr$ and $^{87}Rb/^{86}Sr$. Evidently, the $^{87}Sr/^{86}Sr$ ratios of these rocks, which are all less than one million years old, are positively correlated with their $^{87}Rb/^{86}Sr$ ratios. The line which has been arbitrarily drawn through the cluster of points is *not* an isochron, but may represent a mixing line. The date indicated by the slope of the line as drawn in Figure 9.4 is 773 million years. This date is fictitious because in this case the $^{87}Sr/^{86}Sr$ ratios of these rocks are probably the

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result of a mixing process and are not due to decay of ^{87}Rb in the rocks after their formation. Other examples of correlated $^{87}Sr/^{86}Sr$ and Rb/Sr ratios of Tertiary lava flows were reported by Dickinson et al. (1969), Leeman and Manton (1971), Duncan and Compston (1976), and others.

The positive correlation of initial $^{87}Sr/^{86}Sr$ ratios of igneous rocks and their Rb/Sr ratios is also interpretable as evidence of long-term heterogeneity of the upper mantle. Brooks et al. (1976) listed thirty occurrences of volcanic and plutonic igneous rocks that yield "pseudoisochrons" when the *initial* $^{87}Sr/^{86}Sr$ ratios are plotted versus their $^{87}Rb/^{86}Sr$ ratios. They rejected contamination as the cause for this phenomenon and proposed instead that such pseudoisochrons reflect the age of the mantle from which magma originated. However, sympathetic variations of the isotope ratios of Sr or Nd with the isotope composition of oxygen are more consistent with magma mixing or contamination than with the "mantle-isochron" concept. These matters are at the forefront of research in isotope geology and will come up for discussion in subsequent chapters in this book.

vi.

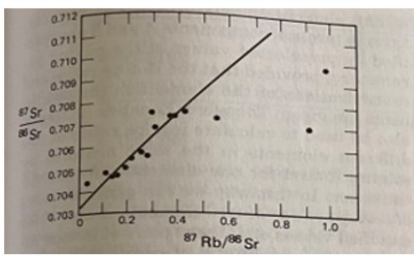

Figure 9.4 Fictitious isochron drawn through the average $^{87}Sr/^{86}Sr$ and $^{87}Rb/^{86}Sr$ ratios different varieties of potassic lavas from the Birunga and Toro-Ankole regions of the East African Rift Valleys. These rocks are known to be Pliocene or younger in age and some may have been erupted in historical time. The correlation of the $^{87}Sr/$

Reference: [Principles of Isotope Geology, 2nd Edition, Faure, 1986 (pgs 145-147)]

Answers4Seekers: Session #12B (semi-technical)

vii. Examples of Isochrons that Are Discordant With One Another

Isochrons are supposed to be more accurate, but they can also conflict with each other.

Table 2. K-Ar, Rb-Sr, Sm-Nd, and Pb-Pb isochron "ages" obtained for the targeted rock units.

Rock Unit	Location	Conventional Age	Method	Number of Samples	Isochron Ages (Ma) K-Ar	Rb-Sr	Sm-Nd	Pb-Pb
Mt. Ngauruhoe andesites	Mt. Ngauruhoe, New Zealand	Historic flows (1949, 1954, 1975)	Direct observation	11 whole rocks (from 5 flows)	Not applicable	133±87 (5 samples)	*197±160* (5 samples)	*3908±390* (7 samples)
Uinkaret Plateau basalts	Western Grand Canyon, Arizona	<1.16±0.18 Ma	K-Ar model	8 (whole rocks)	None	1143±220 (7 samples)	*916±570* (6 samples)	Not available
Somerset Dam layered mafic intrusion	Somerset Dam, southeast Queensland, Australia	216±4 Ma 225.3±2.3 Ma	K-Ar model composite Rb-Sr isochron	15 (whole rocks)	174±8 (15 samples)	393±170 (14 samples)	259±76 (13 samples)	*1425±1000* (13 samples)
Cardenas Basalt	Eastern Grand Canyon, Arizona	1103±66 Ma	Rb-Sr isochron	26 (whole rocks) (14 new, 12 existing)	516±30 (14 samples)	1111±81 (19) 892±82 (22)	1588±170 Ma (8 samples)	*1385±950 Ma* (4 samples)
Bass Rapids diabase sill	Grand Canyon, Arizona	1070±30 Ma	Rb-Sr isochron	11 whole rocks	841.5±164	1055±46(11)	Too much scatter	1250±130 (11)
				DI-13 + minerals (6)	—	1060±24 (7)	1379±140 (7)	Too much scatter
				DI-15 + minerals (11)	—	1075±34 (12)	1330±360 (9)	*1584±420* (10)
				magnetites (7)	—	1007±79 (7)	1336±380 (7)	1327±230 (6)
Apache Group basalts	Central Arizona	1100 Ma	Assumed similar to diabase sills	9 (whole rocks)	Too much scatter	*2295±300* (5)	Not enough spread	1304±69 (8)
Apache Group diabase sills	Central Arizona	1120±10 Ma 1140±40 Ma	zircon U-Pb biotite K-Ar	21 (whole rocks)	Too much scatter	*2067±380*(16)	Too much scatter	1142±98 (19) 1146±59 (18)
Brahma amphibolites	Grand Canyon, Arizona	1740-1750 Ma	zircon U-Pb concordia	27 (whole rocks)	Too much scatter	840±86 (25) 1240±84 (19)	1678±60 (24) 1655±40 (21)	1864±78 (27) 1883±53 (20)
Elves Chasm Granodiorite	Grand Canyon, Arizona	1840±1 Ma	zircon U-Pb	8 (whole rocks)	Not available	1512±140 (7 samples)	1664±200 (7 samples)	1933±220 (7 samples)
Beartooth andesitic amphibolite	Northeast Wyoming	2790±35 Ma	Rb-Sr isochron	1 whole rock + minerals (5)	Too much scatter	2515±110	2886±190	2689.4±8.6

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Link: https://www.icr.org/i/pdf/technical/Isochron-Discordances.pdf (Page 414)

12) Problem-#6: Examples of Radiocarbon (C14) Age-Date Discordances

a. C14 Radiocarbon Dating Method

i. With today's high accuracy Accelerator Mass Spectrometers (AMS), no C14 should be measurable after 90K years of age. Yet, C14 has routinely been measured in Coal, Marble, Fossilized Wood, Dinosaur bones, and even Diamonds. This is strong evidences for a young Earth.

ii. The high precision AMS measurement equipment are capable of measuring C14 levels in the range of <<0.01 pmc. [pMC = precent modern carbon]

iii. Measurement Equipment Accuracy: AMS systems have a sensitivity of at least 0.01 pMC, and have background noise of less than 0.08 pMC, so any gross detected C14 reading over 0.09 is means C14 is actually present (any net pMC over 0.02 pMC means C14 is present).

iv. These young age estimates conflict with deep-time uniformitarian assumptions and deep-time dating methods and results.

v. C14 has a half-life of 5730 years. C14 only represents 1 carbon atom per trillion carbon atoms, so it is very rare.

Answers4Seekers: Session #12B (semi-technical)

b. C14 in Coal, Marble, and Fossilized Wood

i. **C14 is found in many Coal, Marble, & Fossilized Wood samples, which evidences that the materials must be very much younger than 90K years in age,** which squarely conflicts with uniformitarian materialist assumptions of Millions of years (which on their assumptions of deep-time, their conventional geologic-column/fossil-index, and radiometric methods):

1. Uniformitarian Materialist Date-Age Assumptions:
   a. Marble around 65 Mil. to 250 Mil. years old
   b. Coal around 300 million years old
   c. Fossilized Wood at minimum 20 million years old

ii. **There should exist no detectable C14 over 0.09pMC, but table shows they do.**

TABLE 1. AMS Measurements on Samples (2003): (click for reference)

Item	$^{14}C/C$ (pmc) (±1 S.D.)	Material	Reference
9	0.51±0.08	Marble	Gulliksen & Thomsen [21]
13	0.44±0.13	Anthracite (coal)	Vogel *et al.* [45]
14	0.42±0.03	Anthracite (coal)	Grootes *et al.* [20]
25	0.26±0.02	Marble	Schmidt *et al.* [36]
28	0.211±0.018	Fossil wood	Beukens [8]
36	0.18±0.05 (range?)	Marble	Van der Borg *et al.* [44]
47	0.142±0.023	Anthracite (coal)	Vogel *et al.* [45]
49	0.14±0.02	Marble	Schleicher *et al.* [35]
55	0.112±0.057	Bituminous coal	Kitagawa *et al.* [27]

Answers4Seekers: Session #12B (semi-technical)

c. **C14 in Dinosaur Bones,** indicates a max. age from 21K to 41K year olds, not 65 Millions of years; and so, evidences a Young Age for the Earth.

Taxon	Radio-carbon Years BP	pmc	δ13	Stratigraphy	Sample date	Note
Tectocarya rhenana	17850 ± 40	10.84	-25.4	Braunkohle Lignite	6/1/2011	mummified fruit
hadrosaur vert (ICR)	20850 ± 90	7.46	-24.51	Hell Creek Fm.	3/20/2013	Medullary bone
Edmontosaurus sp.	25550 ± 60	4.15	-0.5	Lance Fm.	5/30/2014	vertebra
Phareodus sp.	26,110 ± 60	3.87	-0.4	Green River Fm.	5/30/2014	skull bones & scales
ceratopsian	26300 ± 60	3.78	-3.6	Horseshoe Canyon Fm.	7/14/2014	metacarpal V
hadrosaur vert (ICR)	28790 ± 100	2.78	-20.11	Hell Creek Fm.	3/20/2013	cortical bone
Edmontosaurus sp.	32420 ± 160	1.77	-6.1	Lance Fm.	2/26/2013	phalanx
hadrosaur (ADM)	32770 ± 100	1.69	-3.5	Horseshoe Canyon Fm.	7/14/2014	caudal vertebra
Crossopholis magnicaudatus	33530 ± 170	1.54	-26.18	Green River Fm.	3/20/2013	Paddlefish "cartilage"
Triceratops horridus	33570 ± 120	1.53	-17.1	Hell Creek Fm.	8/14/2012	horn core bulk bone
ceratopsian	36760 ± 130	1.03	-1.7	Horseshoe Canyon Fm.	7/14/2014	caudal vertebra
Axel wood	39720 ± 270	0.71	-22.2	Buchanan Lake Fm.	5/5/2014	unmineralized
Drumheller wood	40040 ± 160	0.68	-24.1	Horseshoe Canyon Fm.		peat-like
Triceratops horridus	41010 ± 220	0.61	-4.3	Hell Creek Fm.	8/14/2012	horn core bioapatite
Czech wood	48160 ± 330	0.25	-22.7	Boskovice Furrow	2/26/2013	carbonized wood
Captorhinus aguti	49470 ± 510	0.21	-29.7	Admiral Fm.	8/5/2014	vert, jaw, leg

Table 1. Carbon isotope data used to plot Figures 1 and 6 are shown from 14 fossils. Radiocarbon ages were copied from referenced sources without calibration or other normalization. Plus/minus value represents 1σ confidence error margins. Pmc refers to percent modern carbon, a ratio of the fraction of ^{14}C to ^{12}C in the sample to the fraction of ^{14}C to ^{12}C in the international standard (where "modern" means AD 1950, and the absolute radiocarbon standard is a sample of wood from a tree that died in AD 1890). Radiocarbon years in "Before Present" are calculated based on pmc. Radiocarbon analyses also supply ^{13}C isotope results, shown as δ13, which represents the parts of ^{13}C in the sample per thousand parts ^{13}C in an international standard. Negative values, below the standard zero value, are typical for samples of great antiquity.

Reference: [Radiocarbon In Dinosaur And Other Fossils (creationresearch.org)]

Answers4Seekers: Session #12B (semi-technical)

i. Uniformitarian-materialist scientists have been saying that Dinosaurs became extinct 65 Million years ago, yet C14 has been found in dinosaur fossils, which means they must be much less than 90K years.

ii. **Even Uniformitarian Materialists now acknowledged that C14 exists in Dinosaur fossils:**

1. Yet to rescue themselves from the C14 conclusions of a Young Earth, they hold to philosophical inconsistencies based on their evolutionary worldview (which requires deep-time to provide any plausibility).

Volume 82, Issue 2
February 2020

THE AMERICAN BIOLOGY TEACHER
Theme Issue: Evolution and Darwin

RESEARCH ARTICLE | FEBRUARY 01 2020

Radiocarbon in Dinosaur Fossils: Compatibility with an Age of Millions of Years

Philip J. Senter

The American Biology Teacher (2020) 82 (2): 72–79.
https://doi.org/10.1525/abt.2020.82.2.72

The recent discovery of radiocarbon in dinosaur bones at first seems incompatible with an age of millions of years, due to the short half-life of radiocarbon. However, evidence from isotopes other than radiocarbon

Radiocarbon in Dinosaur Fossils: Compatibility with an Age of Millions of Years | The American Biology Teacher | University of California Press (ucpress.edu)

6.1.1.1. https://youtu.be/XEtL6XjRqMg (Schweitzer, Dinosaur Blood Cells)

Answers4Seekers: Session #12B (semi-technical)

iii. More dinosaurs Bones containing C14 (indicating a Young Earth)

Dinosaur bones have been dated by radiocarbon (Carbon-14)

Dates range from 22,000 to 39,000 years before present

The dates themselves are not as important as the fact that **there is measurable Carbon-14 in dinosaur bones**. If dinosaurs have been extinct for 65 million years, there should not be one atom of Carbon-14 left in their bones**!**

This is the data from the Paleochronology Group headed by Hugh Miller:

Dinosaur (a)	Lab/Method/Fraction (b,c,d)	C-14 Years B.P.	Date	USA State
Acro	GX-15155-A/Beta/bio	>32,400	11/10/1989	TX
Acro	GX-15155-A/AMS/bio	25,750 ± 280	06/14/1990	TX
Acro	AA-5786/AMS/bio-scrapings	23,760 ± 270	10/23/1990	TX
Acro	UGAMS-7509a/AMS/bio	29,690 ± 90	10/27/2010	TX
Acro	UGAMS-7509b/AMS/bow	30,640 ± 90	10/27/2010	TX
Allosaurus	UGAMS-02947/AMS/bio	31,360 ± 100	05/01/2008	CO
Hadrosaur #1	KIA-5523/AMS/bow	31,050 + 230/-220	10/01/1998	AK
Hadrosaur #1	KIA-5523/AMS/hum	36,480 + 560/-530	10/01/1998	AK
Triceratops #1	GX-32372/AMS/col	30,890 ±200	08/25/2006	MT
Triceratops #1	GX-32647/Beta/bow	33,830 +2910/-1960	09/12/2006	MT
Triceratops #1	UGAMS-04973a/AMS/bio	24,340 ± 70	10/29/2009	MT
Triceratops #2	UGAMS-03228a/AMS/bio	39,230 ± 140	08/27/2008	MT
Triceratops #2	UGAMS-03228b/AMS/col	30,110 ± 80	08/27/2008	MT
Hadrosaur #2	GX-32739/Beta/ext	22,380±800	01/06/2007	MT
Hadrosaur #2	GX-32678/AMS/w	22,990 ±130	04/04/2007	MT
Hadrosaur #2	UGAMS-01935/AMS/bio	25,670±220	04/10/2007	MT
Hadrosaur #2	UGAMS-01936/AMS/w	25,170±230	04/10/2007	MT
Hadrosaur #2	UGMAS-01937/AMS/col	23,170±170	04/10/2007	MT
Hadrosaur #3	UGAMS-9893/AMS/bio	37,660±160	11/29/2011	CO
Apatosaur	UGAMS-9891/AMS/bio	38,250±160	11/29/2011	CO

Reference: Carbon-14 dating dinosaur bones (newgeology.us)

Sample Of C14 Lab Analysis Reports:

Answers4Seekers: Session #12B (semi-technical)

The University of Georgia
Center for Applied Isotope Studies

RADIOCARBON ANALYSIS REPORT

October 29, 2009

Hugo Miller
1215 Bryson Rd.
Columbus, OH 43224-2009

Dear Mr. Miller

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}C$ and $\delta^{15}N$ analyses for the sample received by our laboratory on July 31, 2009.

UGAMS#	Sample I.D.	Material	$\delta^{13}C$ (‰)	Radiocarbon ^{13}C Corrected Age (YBP±1s)
04973a	P-T-1d	bioapatite	-3.1	24340±70

Sample ID	Carbon content,%
P-S-1	0.78
P-S-2	0.11
P-S-3	0.32

The bone was cleaned and washed, using ultrasonic bath. After cleaning, the dried bone was gently crushed to small fragments.
The crushed bone was treated with diluted 1N acetic acid to remove surface absorbed and secondary carbonates. Periodic evacuation insured that evolved carbon dioxide was removed from the interior of the sample fragments, and that fresh acid was allowed to reach even the interior micro-surfaces. The chemically cleaned sample was then reacted under vacuum with 1N HCl to dissolve the bone mineral and release carbon dioxide from

The University of Georgia
Center for Applied Isotope Studies

RADIOCARBON ANALYSIS REPORT

May 1, 2008

Hugo Miller
1215 Bryson Rd.
Columbus, OH 43224-2009

Dear Mr. Miller

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}C$ and for the sample received by our laboratory on March 31, 2008.

UGAMS#	Sample I.D.	Material	$\delta^{13}C$ (‰)	Radiocarbon ^{13}C Corrected Age (YBP±1s)	pmC
02947	P-A-4	bioapatite	-6.6	31360±100	1.98±0.04

The bone was cleaned and washed, using ultrasonic bath. After cleaning, the dried bone was gently crushed to small fragments.
The crushed bone was treated with diluted 1N acetic acid to remove surface absorbed and secondary carbonates. Periodic evacuation insured that evolved carbon dioxide was removed from the interior of the sample fragments, and that fresh acid was allowed to reach even the interior micro-surfaces. The chemically cleaned sample was then reacted under vacuum with 1N HCl to dissolve the bone mineral and release carbon dioxide from

Answers4Seekers: Session #12B (semi-technical)

The University of Georgia

Center for Applied Isotope Studies

RADIOCARBON ANALYSIS REPORT

August 27, 2008

Hugo Miller
1215 Bryson Rd.
Columbus, OH 43224-2009

Dear Mr. Miller

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}C$ and analyses for the samples received by our laboratory on June 27, 2008.

UGAMS#	Sample I.D.	Material	$\delta^{13}C$ (‰)	Radiocarbon ^{13}C Corrected Age (YBP±1s)
03228a	P-T-2a	bioapatite	-4.7	39230±140
03228c	P-T-2a	collagen	-23.8	30110±80
03229	P-T-2b	bulk material	carbon content- 1.30%	

Carbon content is given for the bulk sample and reflects both carbonate and organic carbon concentration.

The crushed bone was treated with diluted 1N acetic acid to remove surface absorbed and secondary carbonates. Periodic evacuation insured that evolved carbon dioxide was removed from the interior of the sample fragments, and that fresh acid was allowed to reach even the interior micro-surfaces. The chemically cleaned sample was then reacted under vacuum with 1N HCl to dissolve the bone mineral and release carbon dioxide from bioapatite.

The crushed bone was treated with 1N HCl at 4ºC for 24 hours. The residue was filtered, rinsed with deionized water and under slightly acid condition (pH=3) heated at 80ºC for 6

The University of Georgia

Center for Applied Isotope Studies

RADIOCARBON ANALYSIS REPORT

April 10, 2007

Hugo Miller
1215 Bryson Rd.
Columbus, OH 43224-2009

Dear Mr. Miller

Enclosed please find the results of ^{14}C Radiocarbon analyses and Stable Isotope Ratio $\delta^{13}C$ and $\delta^{15}N$ analyses for the samples received by our laboratory on February 23, 2007.

UGAMS#	Sample I.D.	Material	Size, mg	$\delta^{13}C$ (‰)	Radiocarbon ^{13}C Corrected Age (YBP±1s)	pmC
01935	P-H-3a	bioapatite	1.00	-6.4	25670±220	4.09±0.12
01936	P-H-3a	charred bone	0.47	-15.7	25170±230	4.36±0.12
01937	P-H-3a	collagen	0.59	-22.7	23170±170	5.59±0.12
01938	P-H-3a	humic acid	0.35	-21.5	2560±70	72.68±0.59

The bone was cleaned and washed, using ultrasonic bath. After cleaning, the dried bone was gently crushed to small fragments. The charred bone was treated with 5% HCl at the temperature 80°C for 1 hour, then it was washed and with deionized water on the fiberglass filter and rinsed with diluted NaOH to remove possible contamination by humic acids. After that the sample was treated with diluted HCL again, washed with deionized water and dried at 60°C.The prepared samples was transferred to quartz tube and combusted at 900ºC.

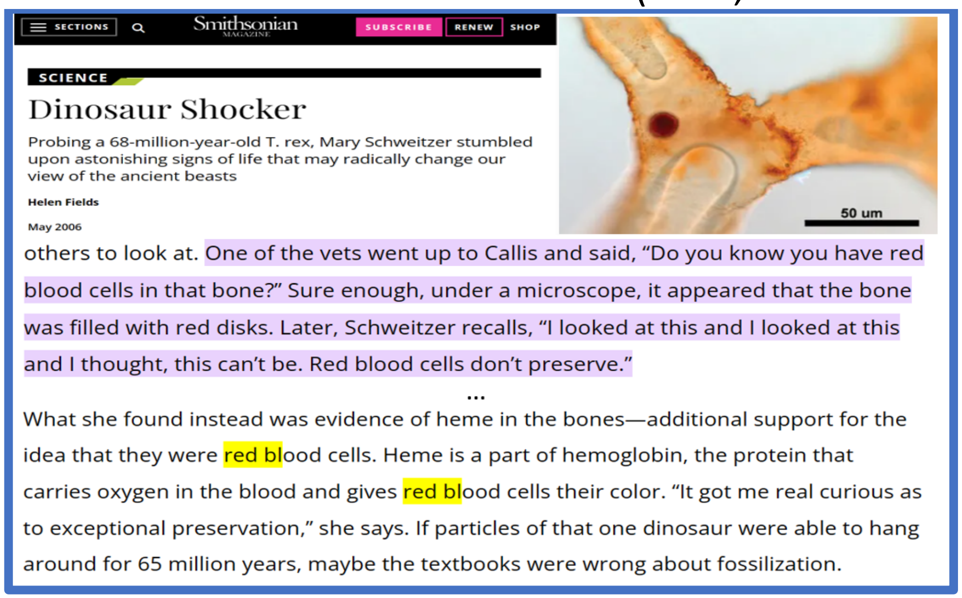
Answers4Seekers: Session #12B (semi-technical)

iv. Dinosaur fossils with Red blood Cells, Soft Tissue, ,and DNA Evidence

1. Red blood cells, Soft Tissue in Fossils, and DNA evidence in Dinosaur Fossils evidence a young age for Dinosaurs and a young age for the Earth

2. No historically datable human DNA has exceeded 5000 years old; and buried DNA is believed to degrade completely [within 10K year](#).

3. Red Blood cells found in T-Rex Dinosaur (2006, Smithsonian Mag., Schweitzer):



SECTIONS Smithsonian MAGAZINE SUBSCRIBE RENEW SHOP

SCIENCE

Dinosaur Shocker

Probing a 68-million-year-old T. rex, Mary Schweitzer stumbled upon astonishing signs of life that may radically change our view of the ancient beasts

Helen Fields

May 2006

50 um

others to look at. One of the vets went up to Callis and said, "Do you know you have red blood cells in that bone?" Sure enough, under a microscope, it appeared that the bone was filled with red disks. Later, Schweitzer recalls, "I looked at this and I looked at this and I thought, this can't be. Red blood cells don't preserve."

...

What she found instead was evidence of heme in the bones—additional support for the idea that they were red blood cells. Heme is a part of hemoglobin, the protein that carries oxygen in the blood and gives red blood cells their color. "It got me real curious as to exceptional preservation," she says. If particles of that one dinosaur were able to hang around for 65 million years, maybe the textbooks were wrong about fossilization.

LINK: Dinosaur Shocker | Science| Smithsonian Magazine 2006, Schweitzer
LINK: ResearchGate Blood from Stone 2010, Schweitzer
LINK: https://youtu.be/XEtL6XjRqMg

Answers4Seekers: Session #12B (semi-technical)

4. The Expectation Was That All Tissue and Red Blood Cells Should Have Already Been Completely Degraded and Not Available in the Fossil:

MARY HIGBY SCHWEITZER during NOVA TV: **"When you think about it, the laws of chemistry and biology and everything else that we know say that it should be gone. It should be degraded completely."**

Reference: NOVA _ Transcripts _ July 24, 2007 Dinosaur tissue and red cells, Schweitzer _ PBS

Answers4Seekers: Session #12B (semi-technical)

5. Soft Tissue still in Dinosaur (again evidencing a young age for Dinosaurs and a young age for the Earth).

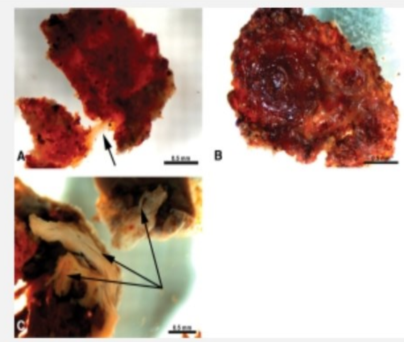
Analyses of Soft Tissue from *Tyrannosaurus rex* Suggest the Presence of Protein

Mary Higby Schweitzer,[1,2,3]* Zhiyong Suo,[4] Recep Avci,[4] John M. Asara,[5,6] Mark A. Allen,[7] Fernando Teran Arce,[4,8] John R. Horner[3]

We performed multiple analyses of *Tyrannosaurus rex* (specimen MOR 1125) fibrous cortical and medullary tissues remaining after demineralization. The results indicate that collagen I, the main organic component of bone, has been preserved in low concentrations in these tissues. The findings were independently confirmed by mass spectrometry. We propose a possible chemical pathway that may contribute to this preservation. The presence of endogenous protein in dinosaur bone may validate hypotheses about evolutionary relationships, rates, and patterns of molecular change and degradation, as well as the chemical stability of molecules over time.

T. rex Fossil Yields Soft Tissue

Material may contain preserved biomolecules



References:

https://www.researchgate.net/publication/6397675_Analyses_of_Soft_Tissue_from_Tyrannosaurus_rex_Suggest_the_Presence_of_Protein

https://www.nsf.gov/news/news_summ.jsp?cntn_id=103152

https://youtu.be/XEtL6XjRqMg

6. Cartilage and DNA Evidence in Dinosaur Fossil (evidencing a Young Age-Date):

NC STATE UNIVERSITY News

Original Cartilage and Evidence of DNA Preserved in 75 Million-Year-Old Baby Dinosaur

March 2, 2020 | 4-min. read

"We used two different kinds of intercalating stains, one of which will only attach to DNA fragments in dead cells, and the other which binds to any DNA," Schweitzer explains. "The stains show point reactivity, meaning they are binding to specific molecules within the microstructure and not smeared across the entire 'cell' as would be expected if they arose from bacterial contamination."

References: Original Cartilage and Evidence of DNA Preserved in 75 Million-Year-Old Baby Dinosaur | NC State News (ncsu.edu)
Evidence of proteins, chromosomes and chemical markers of DNA in exceptionally preserved dinosaur cartilage

Answers4Seekers: Session #12B   (semi-technical)

v. C14 in Diamond Samples – Discordant Dates

i. Uniformitarian Materialists estimate Diamonds to be at least several million years old. C14 studies have identified C14, projecting an age of around 55.7K years old, which supports a Young Earth age over deep-time age.

ii. In 2005 the ICR RATE project measured 8 diamonds from four different countries in Africa (Botswana, South Africa, Guinea, and Nambia) to see if any C14 might exist within them.

iii. Detectable amounts of C14 were found in the diamonds and projecting a conventional equivalent age of around 55,700 years:

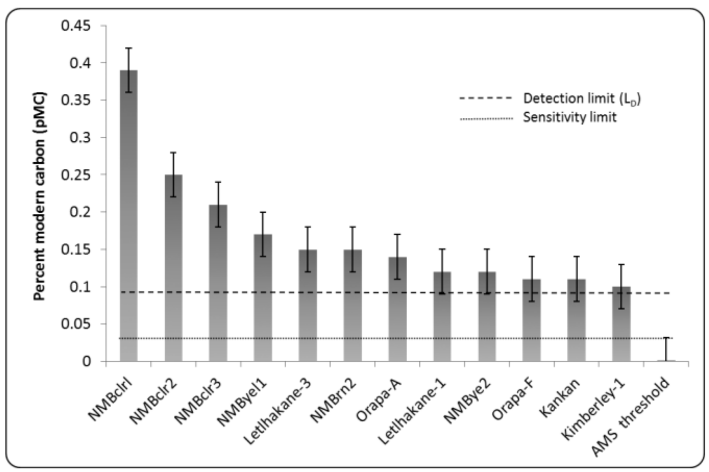


Figure 4. RATE diamonds show with 99.7% confidence that residual/intrinsic ^{14}C is present in nine of twelve measurements.

LINK: 2005, Baumgardner.indd (icr.org) 613-614

https://www.icr.org/i/pdf/technical/Carbon-14-Evidence-for-a-Recent-Global-Flood-and-a-Young-Earth.pdf

Answers4Seekers: Session #12B (semi-technical)

iv. **Even Secular Universities in California in 2007 also Identified C14 in 8 Diamonds**, yielding a conventional age of 64,900 to 80,000 years. These secular scientists could not believe these ages which conflicted with their expectation, and so attributed it to "machine background" noise, but if machine noise, the system should not have been able to identify different levels of C14, which it did. (Also, please review again ASM system accuracy.)

2007 Taylor, R. E., and J. Southon, 2007. Use of natural diamonds to monitor 14C AMS instrument backgrounds

Table 2

Carbon isotope and $^{12}C^-$ current measurements on (A) six splits from of a single natural diamond and (B) individual natural diamonds ($N = 8$) with associated analysis of Ceylon graphite made during diamond measurements

Sample no.	Sample material[a]	Maximum current ($\mu A\,^{12}C^-$)	$\delta^{13}C$[b] (‰)	^{14}C Content fraction modern (fm)	Conventional ^{14}C age (ka yrs. BP)
A. Splits from single natural diamond and associated Ceylon geological graphite					
UCIAMS-12677	D	131	−0.3	0.00018 ± 0.00001	69.4 ± 0.5
UCIAMS-12678	D	127	−5.6	0.00017 ± 0.00002	69.6 ± 0.8
UCIAMS-12676	D	145	4.2	0.00017 ± 0.00001	70,0 ± 0.5
UCIAMS-12679	D	168	−19.3	0.00016 ± 0.00001	70.3 ± 0.5
UCIAMS-12674	D	122	3.2	0.00015 ± 0.00001	70.6 ± 0.7
UCIAMS-12675	D	184	− 0.5	0.00015 ± 0.00001	70.6 ± 0.6
UCIAMS-12680	G	81	−4.9	0.00025 ± 0.00002	66.5 ± 0.6
UCIAMS-12681	G	70	−11.0	0.00020 ± 0.00003	68.3 ± 1.1.
B. Individual natural diamonds and associated Ceylon geological graphite					
UCIAMS-15445	D	136	−14.1	0.00021 ± 0.00003	68.1 ± 1.2[c]
UCIAMS-15444	D	125	−15.4	0.00018 ± 0.00002	69.4 ± 1.0[c]
UCIAMS-15443	D	125	−20.5	0.00015 ± 0.00002	70.9 ± 1.0[c]
UCIAMS-15446	D	127	−23.1	0.00013 ± 0.00002	71.7 ± 1.0[c]
UCIAMS-15447	D	127	−19.8	0.00011 ± 0.00002	3.3 ± 1.6[c]
UCIAMS-9638	D	250	−20.5	0.00008 ± 0.00001	75.7 ± 0.8[d]
UCIAMS-9640	D	240	− 3.1	0.00006 ± 0.00001	78.4 ± 0.9[d]
UCIAMS-9639	D	197	4.7	0.00005 ± 0.00001	80.0 ± 1.1[d]
UCIAMS-15440	G	131	−11.5	0.00069 ± 0.0004	58.4 ± 0.5
UCIAMS-15441	G	122	−10.7	0.00035 ± 0.00004	64.0 ± 0.5
UCIAMS-15442	G	95	−9.4	0.00032 ± 0.00003	64.7 ± 0.8
UCIAMS-9641	G	106	−3.1	0.00024 ± 0.00002	70.1 ± 0.8[e]
UCIAMS-9642	G	111	0.2	0.00024 ± 0.00002	67.0 ± 0.7[f]

[a] D = Diamond, G = Ceylon geological graphite.
[b] $\delta^{13}C$ Values measured using the AMS spectrometer. These values can differ, typically by 1–3‰, from that measured on a conventional mass spectrometer.
[c] Associated Ceylon geologic graphite measurements: UCIAMS-15440, 15441 and 14440.
[d] Associated Ceylon geologic graphite measurements: UCIAMS-9641 and 9642.
[e] Graphite baked in air prior to analyses.
[f] Graphite baked in hydrogen prior to analyses.

R.E. Taylor, J. Southon / Nucl. Instr. and Meth. in Phys. Res. B 259 (2007) 282–287

v. **But even this above UoC study from 2007 has 6 of the 10 diamonds sent for analysis having detectable C14 above the AMS' 0.8 pMC background value:**

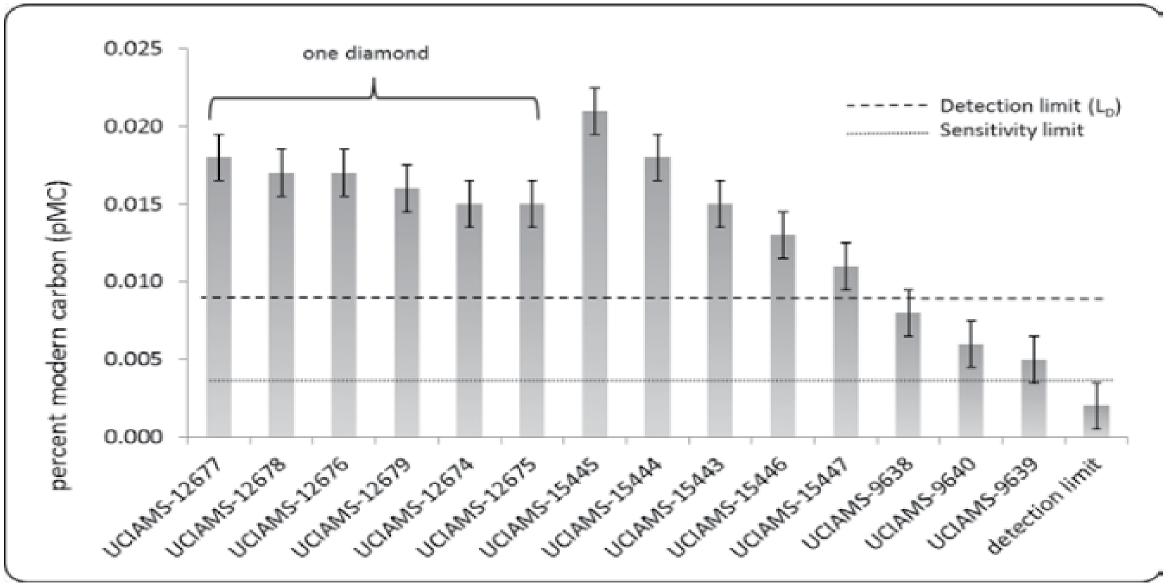


Figure 3. Background values from Taylor and Southon (2007) were used to estimate a L_D of approximately 0.8 pMC at 99.7% confidence (dashed line). Dotted line represents an AMS sensitivity limit estimate. The most parsimonious interpretation of pMC levels above both lines is that from six to ten of their ten diamonds contained intrinsic radiocarbon.

Deep Time Philosophy Impacts Radiocarbon Measurements, 2019, CRSQ, Vernon R. Cupps and Brian Thomas

Answers4Seekers: Session #12B (semi-technical)

13) Problem-#7: Radiometric Dates are wrong when we know the Actual Date the Rock Formed

a. When rock formation are observed and recorded (age is known), Radiometric Dating Models project the wrong dates:

   i. Examples:

      1. **“Flow-Date”** = Human Observed Actual Date of Rock Forming
      2. **“Age (ka)”** = Radiometric Date Age of Rock Forming [Ka = 1000 years]

Table 1. Selected published anomalously old K-Ar dates for historic flows.

Volcano	Flow date vs.	Age (ka)	Reference
Mt St Helens	1986 ↔	350 ±50	Austin (1996)
Mt Erebus	1984	48 ±8	Esser et al. (1997)
Mt Erebus	1984	179 ±16	Esser et al. (1997)
Mt Erebus	1984	50 ±30	Esser et al. (1997)
Mt Erebus	1984	640 ±30	Esser et al. (1997)
Mt Erebus	1984	101 ±16	Esser et al. (1997)
Mt Ngauruhoe	Feb 19 1975	1000 ±200	Snelling (1998)
Kilauea	1972	80 ±240	Ozawa et al. (2006)
Mt Etna	May 1964	700 ±10	Krummenacher (1970)
Mt Stromboli	Sep 23, 1963	2400 ±2000	Krummenacher (1970)
Kilauea Iki	1959	8500 ±6800	Krummenacher (1970)
Mt Ngauruhoe	Jul 14, 1954	1000 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 30, 1954	3500 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 30, 1954	1200 ±200	Snelling (1998)
Mt Ngauruhoe	Jun 4, 1954	1500 ±100	Snelling (1998)
Mt Ngauruhoe	Feb 11, 1949	1000 ±200	Snelling (1998)
Mt Lassen	1915	110 ±30	Dalrymple (1969)
Novarupta	1912	2360 ±50	Shormann (2013)

Table 1. Selected published anomalously old K-Ar dates for historic flows.

Volcano	Flow date vs.	Age (ka)	Reference
Hualalai	1801 ↔	80 ±70	Ozawa et al. (2006)
Hualalai	1801	390 ±30	Ozawa et al. (2006)
Hualalai	1800–1801	300 ±40	Ozawa et al. (2006)
Hualalai	1800–1801	540 ±50	Ozawa et al. (2006)
Hualalai	1800–1801	1410 ±80	Dalrymple (1969)
Hualalai	1800–1801	1600 ±160	Dalrymple (1969)
Hualalai	1800–1801	22800 ±16500	Krummenacher (1970)
Kilauea	> 1800	12000 ±2000	Noble and Naughton (1968)
Kilauea	> 1800	21000 ±8000	Noble and Naughton (1968)
Mt Etna	1792	350 ±140	Dalrymple (1969)
Medicine Lake	> 1500	12600 ±4500	Krummenacher (1970)
Rangitoto	> 1300	150 - 470	McDougall et al. (1969)
Sunset Crater	1064–1065	250 ±150	Dalrymple (1969)
Sunset Crater	1064–1065	270 ±90	Dalrymple (1969)
Kilauea	> 1000	42900 ±4200	Dalrymple and Moore (1968)
Kilauea	> 1000	30300 ±3300	Dalrymple and Moore (1968)
Mt Etna	122 BC	250 ±80	Dalrymple (1969)

Reference: Tapping the Hourglass: Disequilibrium Relaxation Following Accelerated Nuclear Decay Nathan Mogk, **2023, p328:**

Answers4Seekers: Session #12B (semi-technical)

14) Answering Some Secular Challenges:

#	Challenges Against Radiometric Concerns from A Secular Professor of Environmental Science	Response to the Challenge (this info can be found within this document)
1	**Isochron methodology is robust and always accurately identifies the exact amount original of daughter product in the sample at the Rock's age-0 (formation).**	Isochrons have shown they can be discordant & Faure has identified "false" Isochrons.
2	**C14 found in Diamond was only due to processing "non-closed system" contamination, giving a false positive. The "ion-drift in the measurement system could not tell the difference between little ^{14}C and no ^{14}C14."**	Both secular and creation scientist confirm C14 found in some diamonds and today's AMS systems are accurate to positively detect C14 when over 0.09 pMC)
3	**Mt. St. Helen's lava basalt known to be 10-year, does not support Discordant radiometric dating of old ages; but is just an error due dating instrument's resolution limits (minimum +/- 3my).**	Measurement equipment was found to be accurate to avoid measurement noise.
4	**Young Earth Creationists are biased in interpreting evidence and dates since they have a "foregone conclusions" while old-earth Materialists have absolutely no "foregone conclusions" or bias.**	Both Materialists and Creationists have worldviews from which they interpret evidence.
5	**C14 found in Dinosaur bones does not mean they are not ancient.**	When C14 is found in any object, that C14 cannot be more than 90K years old.
6	**Requirements for good radiometric dating results require: a) closed system, b durationally fixed decay rates, c) determination of amount of daughter product at age Zero.**	Agreed, among other required assumptions.
7	**K-Spar Felspar crystals cannot have any Ar at rock solidification, only Ar from ^{40}K Radio-Isotope decay**	This statement is speculative, since no one was present when the K-Spar formed to absolutely confirm Ar was not present at formation or that the K40 decay-rate of K40 remained absolutely fixed.
8	**Must assume that in 87Ru → 87Sr decay, that the 87Sr to 86Sr (stable) ratio was fixed and complete homogenous at solidification (age-0).**	This statement is speculative, both radiometric decay-rates and ratios have identify by secular scientists as not being "fixed" under all times or conditions.
9	**Half-lives of Radio-Isotopes decay rate have been durationally fix throughout all time, and only relativity-speeds or gravity-wells could affect the fixed decay rate.**	Radiometric decay-rates have identify by secular scientists as not being "fixed" under all times or conditions.
10	**Radiometric Dates index well with their super-position.**	C14 in Diamonds , KBS Tuffs, 1996 Mt. St. Helen's basalt date, are examples of geologic column discordance.
11	**14C cannot be detected in any sample after 46,000 years, so any prior living material with no perceptible 14C is older than 46,000 years.**	This is true, that is why C14 in Dinosaur bone, coal, and diamond evidence inaccuracy of radiometric dating and imply a young Earth

Answers4Seekers: Session #12B (semi-technical)

15) Summary:

i. **Recorded history** has only existed for the past 5100 years (and only 3900 years with calendar accuracy). When this is lacking, estimating the age of an event in history can only be pursued through "models with assumptions."

ii. **The formation of the earth** is a past event, before any human observation was available to view it and record it, therefore it is not a **historic** event, but a **pre-historic** event. Therefore, all models that estimate the age of the earth are based on a set of required, but unprovable, assumptions that align with the modeler's worldview.

iii. **Age-Dating Models** seek to estimate the age of the earth by various methodologies. In this "Part 12B" we reviewed the method of Radiometric age-dating models, their required assumptions, their resulting date-age estimates, examples of changes in radioisotope decay-rates, and examples of radiometric age-dating discordances (conflicts).

iv. **Radiometric Dating methodology requires 8 unproveable assumptions (review section 8) to be posited, additionally when we do observed the formation of new rocks and know its age (as in Mt. St. Helens 1986), the Radiometric Calculated ages do not match the known eye-witness ages.**

v. **The strongest level of evidence for any aspect of an Historic Past Event** is when it is observed and communicated by a living, reliable, and capable eye-witness. This is what the Bible proposes to do.

Answers4Seekers: Session #12B (semi-technical)

16) References & Additional Resources:

a. Books:

i. 2005, Thousands … Not Billions, DeYoung
ii. 2017, The Expanse of Heaven, Faulkner
iii. 2019, Rethinking Radiometric Dating, Cupps
iv. 1966, Pre-History an Earth Models, Cook
v. 1973, Before Civilization, Renfrew
vi. 2014, Genetic Entropy, Sanford
vii. 2020, Creation Basics & Beyond, ICR
viii. https://creation.com/
ix. https://answersingenesis.org/
x. https://www.icr.org/
xi. https://biblicalscienceinstitute.com/
xii. Is Genesis History, YouTube Video

Answers4Seekers: Session #12B (semi-technical)

b. Radiometric Discordant Dating: (no links – search for these articles on the internet)

2023, ICR, Mogk, Tapping the Hourglass - Accelerated Decay & Discordance Table.pdf
2023, ICR, Beachy, How Often Do Radioisotope Ages Agree, 36% Discordant.pdf
2021, AIG, petrology_tapeats_sandstone.pdf
2020, ICR, Cupps, Fission Tracks in Crystalline Solids - Discordant ages, 75Mya to 914Mya, Cupps.pdf
2019, ICR, Cupps, Excess 87-Strontium Ratio .pdf
2017, AIG, 238u-235u Half-life reduction and changes in 238u-235u ratios.pdf
2015, AIG, radioisotope-decay-constants-samarium-147 - 106Bya v 117Bya - disparant.pdf
2014, AIG, radioisotope-decay-half-lives-rubidium-87, 43Bya v 62Bya - disparent.pdf
2009, Secular, 238U-235U Discordant Ratios, Pb-Pb Dating.pdf
2005, RATE2, Fission-Tracks-in-Zircons, Page 218 & 238.pdf
2005, ICR, 2005, Young-Helium-Diffusion-Age-of-Zircons, He 6K vs U 1.5B years.pdf
2003, CMI, The dating game, Australian bones, 19K v 26K v 42K, v 62K years.pdf
2001, CMI, Monut St Helens Lava dome, Radio-dating in Rubble.pdf
2001, AIG, The Lava Dome at Mount St Helens Debunks Dating Methods 10y vs 1.4Mya.pdf
2001, AIG, More and More Wrong Dates _ Answers in Genesis.pdf
2000, Secular, The First Australians, 30K v 62k years, question, aust sci 2000a.pdf
2000, Secular, Redating Australia's oldest human, 19K v 45K v 70K v 98K years, 2000, Bowler.pdf
2000, Secular, Brown, The first Australians the debate continues, 30K vs 62K years.pdf
2000, AIG, Conflicting-Ages 37K v. 45Ma, Tertiary-Basalt-and-Fossilized-Wood, Snelling.pdf
1999, AIG, Radioactive "Dating" Failure, Chart.pdf
1998, Secular, True Age Of Controversial Jinmium Rock Shelter less than 120K vs. 4K years _ ScienceDaily, 1998.pdf
1996, Secular, Archaeology and thermoluminescence dating of Jinmium rock-shelter, 120K+years, 1996.pdf
1996, AIG, Argon In Mineral Concentrates Mount St Helens Volcano (10y v 2.8Mya).pdf
1995, CMI, 230M v 5M v 2.9M v 1.6M years, The pigs took it all, discordant dating.pdf
1990, SECULAR, Age of the Peach Springs Tuff, (discordant dates 12-20 Mya), Nielson.pdf

Answers4Seekers: Session #12B (semi-technical)

c. Radiometric Decay-rate Variations: (no links – search for these articles on the internet)

2023, Secular, Hayakawa, Half-life of the nuclear cosmochronometer 176Lu, 37Bya to 3.7hrs.pdf

2021, SECULAR, EFFECT OF SOLAR FLARES ON 54Mn AND 57Co RADIOACTIVE DECAY, Walg.pdf

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