

DISCUSSION 8

THE GREAT TIME QUESTIONS

Part 2: Questions About a Recent Creation

Ariel A. Roth
sciencesandscriptures.com

OUTLINE

- 1. Introduction: The questions**
- 2. Time questions about a recent creation**
 - a. Coral reefs: Living and fossil**
 - b. Ancient glaciation**
 - c. Radiometric dating**
- 3. Conclusions**
- 4. Review questions**

1. INTRODUCTION

1. INTRODUCTION

The major conflict in the time controversy is whether, in particular, life has been here on earth, evolving for billions of years, or whether as the Bible implies, God created life here just a few thousand years ago.

Details of various interpretations were presented in the previous discussion: Part 1 of THE GREAT TIME QUESTIONS (Discussion 7). The contrast between the two models being considered is huge, and to get a more complete account you may want to also read the next discussion, Part 3 of THE GREAT TIME QUESTIONS (Discussion 9), which deals with data on the opposite side of the time controversy.

1. INTRODUCTION

Several factors in nature are often mentioned when the idea of a recent creation is being challenged. We will consider: (a) coral reefs, (b) glacial varves (annual layers in ice) and (c) radiometric dating.

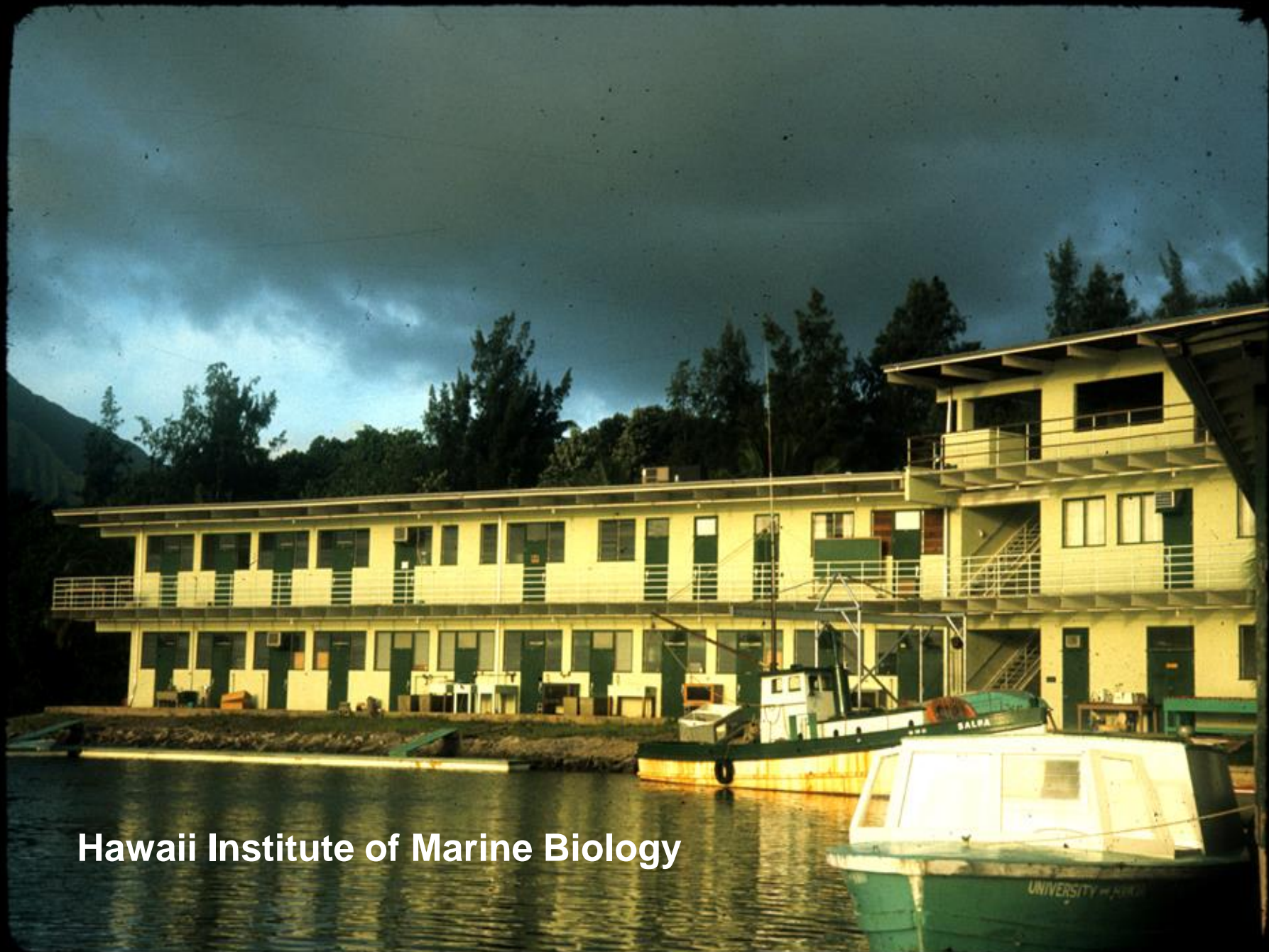
2. TIME QUESTIONS ABOUT A RECENT CREATION

**a. Coral reefs: Living
and fossil**

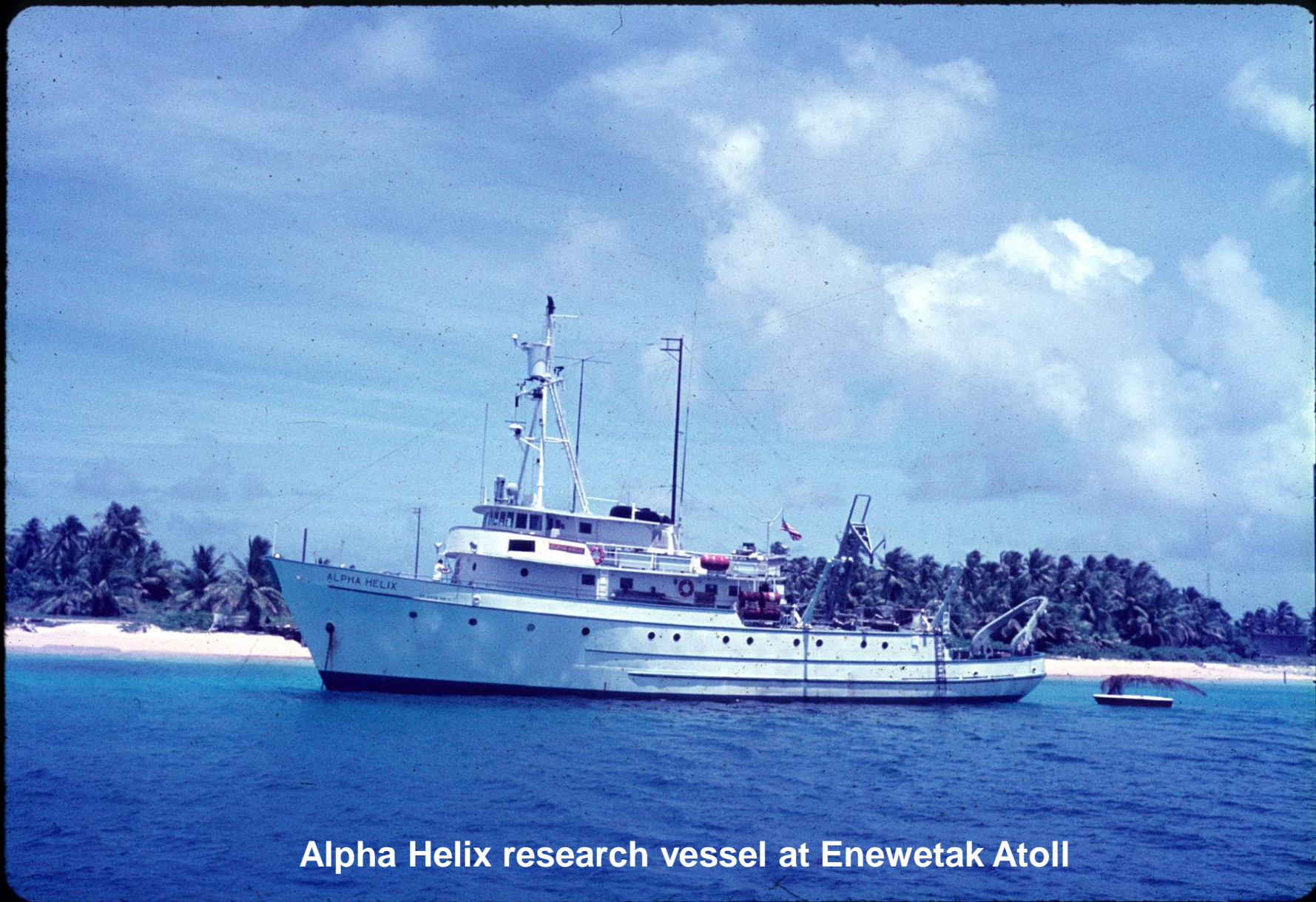
2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS

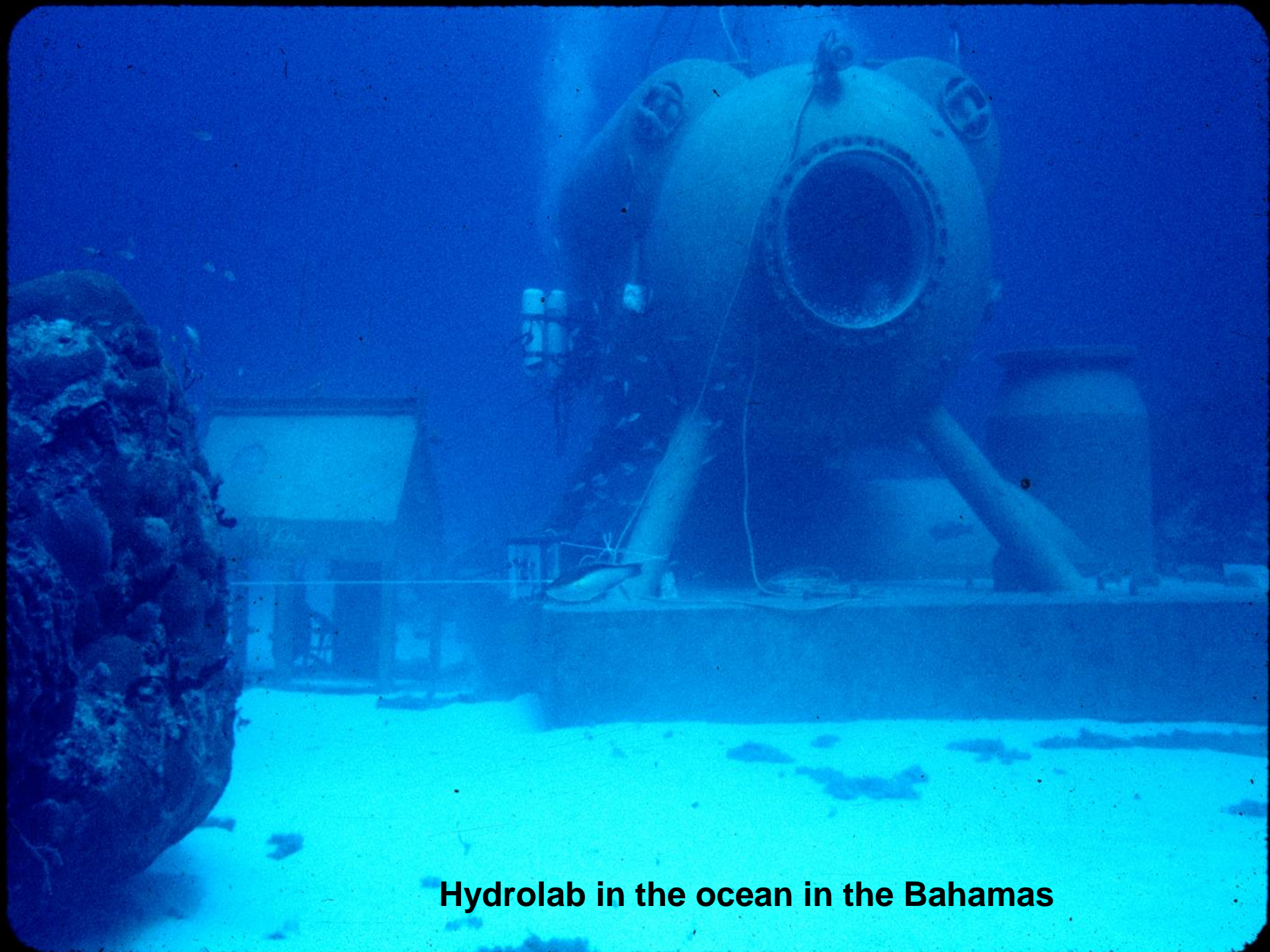
The author of these discussions (Ariel A. Roth) has spent a number of years with his graduate students studying factors related to coral reef growth. Coral reefs grow almost exclusively in the tropics and you have to go there to study them. Some leading research facilities have been made available for their research. Below are five illustrations of three examples of the facilities they used. (1) The Hawaii Institute of Marine Biology (2) The Scripps Institution of Oceanography Alpha Helix research vessel at Enewetak Atoll; (3) The Hydrolab in the Bahamas where they lived for a week under water very near to the coral they were studying. (4) Interior of the Hydrolab, the author is in the top bunk; (5) Hydrolab at Smithsonian National Museum, now moved to NOAA Headquarters.



Hawaii Institute of Marine Biology



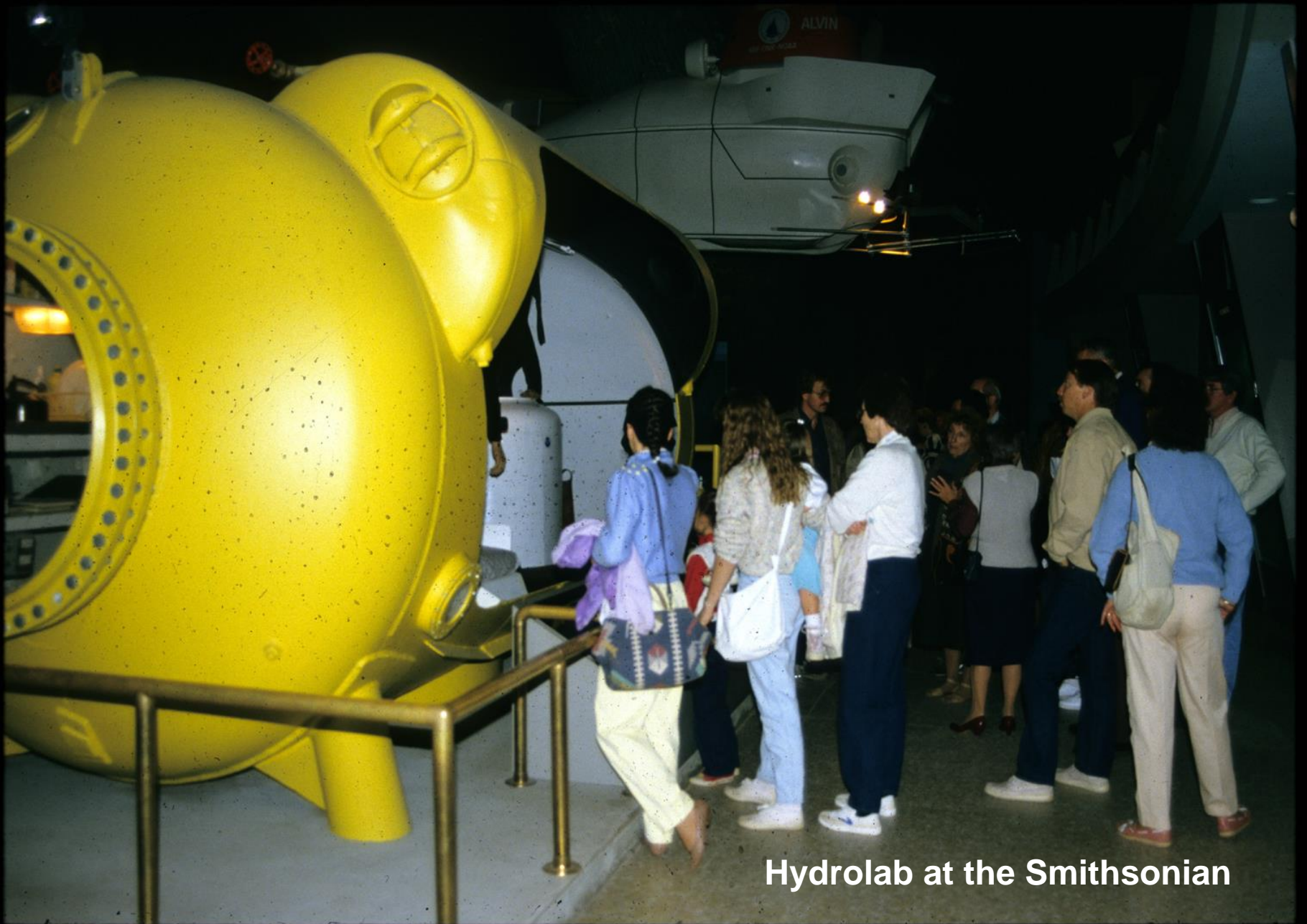
Alpha Helix research vessel at Enewetak Atoll



Hydrolab in the ocean in the Bahamas



Inside the Hydrolab



Hydrolab at the Smithsonian

**2. TIME QUESTIONS
ABOUT A RECENT
CREATION**

a. Coral reefs:

The living reefs

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs)

The question about time is whether or not one could grow huge, slowly growing, deep, living reefs in the few thousand years of time since creation or the Genesis Flood as described in the Bible.

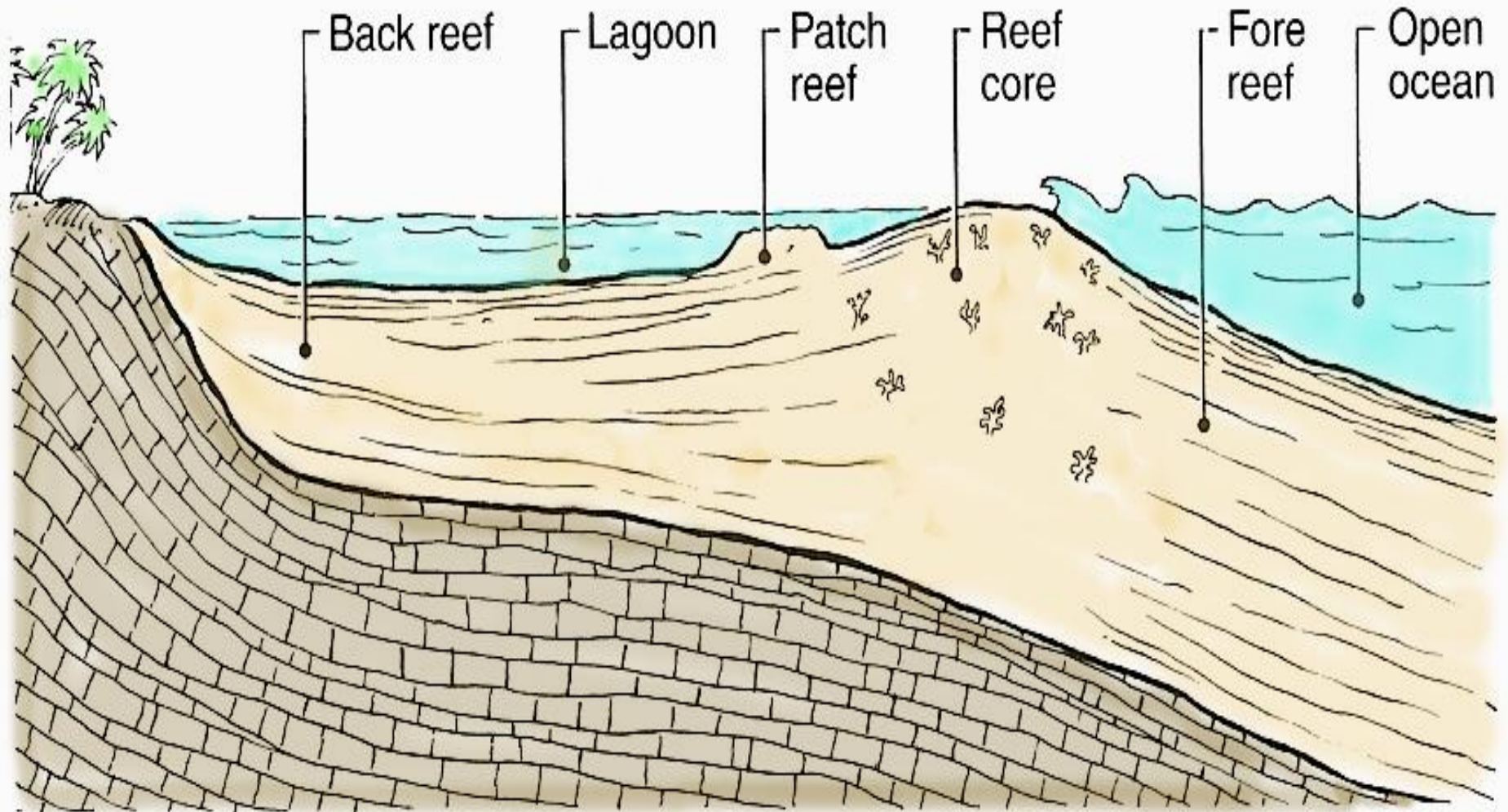
There are several kinds of reefs. Reefs growing on the sides of islands are called fringing reefs. Generally circular reefs are called atolls. These are the deepest ones and the ones we are most interested in since they would take the longest time to grow. They consist of a ring of islands and ridges between the islands, all made of limestone, that lie in the open ocean above deeper volcanic rocks. The limestone is assumed to have been produced by coral, algae, etc. The middle of the ring is partially filled with limestone, leaving a shallow lagoon of seawater above.

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

The next slide is a cross section of a typical fringing reef. The light-tan layers in the illustration represent the reef which lies above other darker rock layers. The reef is limestone (calcium carbonate) and is produced by living organisms located in the top part of the core. There, coral, algae, and other organisms precipitate the limestone from chemicals in sea water.

CROSS SECTION OF A REEF



2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

The next slide is a view of part of Enewetak Atoll, a living reef in the western Pacific Ocean. It is a ring of reef material about 30 kilometers in diameter lying above volcanic rock. The lagoon is to the left of the string of reef material running up through the picture, while the deep ocean lies to the right. In this atoll there are more than three dozen islands that rise above sea level. One island is seen at the end of the arrow. The reef is about as thick (deep) as that island is long. After World War II one of the islands was eliminated by a single hydrogen bomb test.



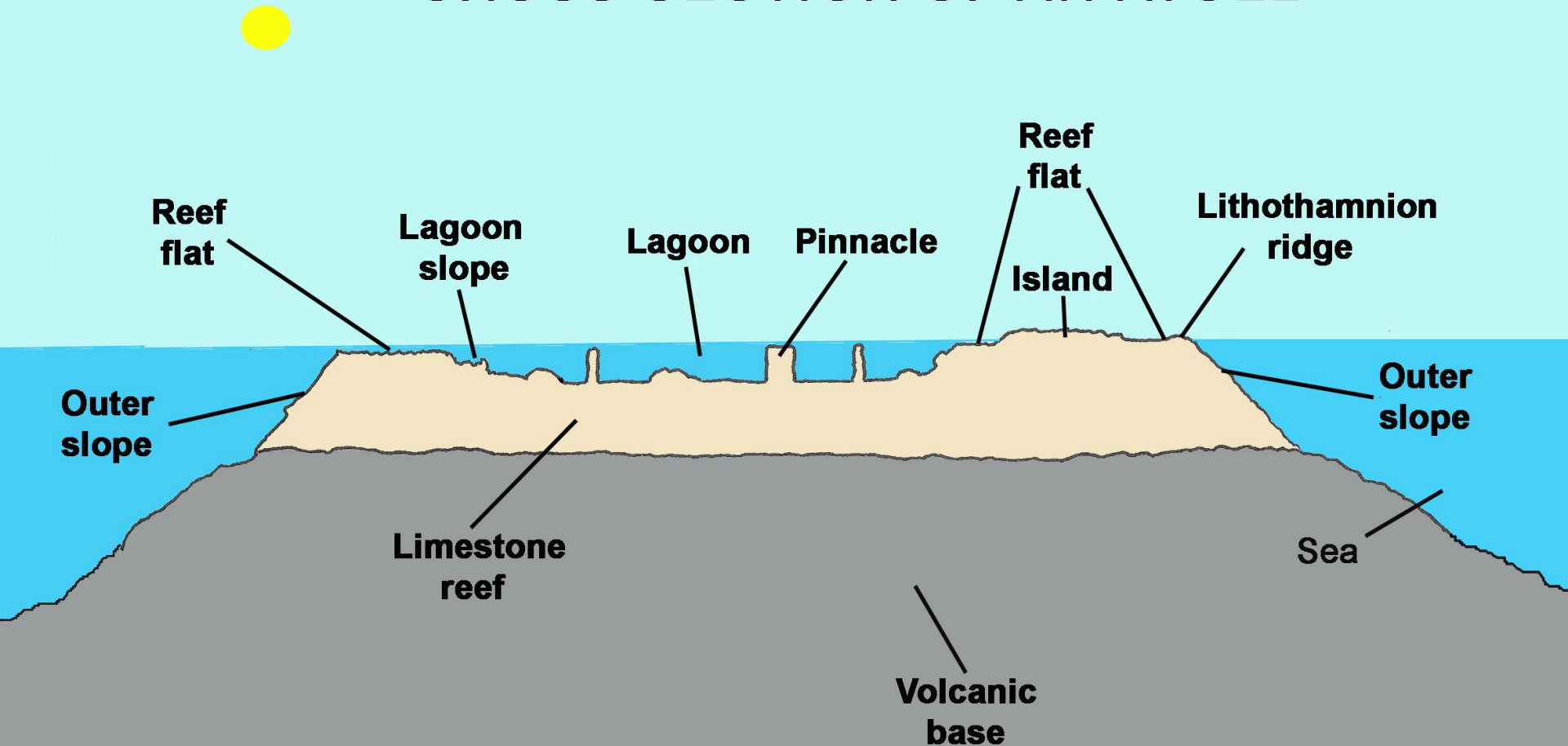
Enewetak Atoll

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

A cross section of an atoll is illustrated in the next slide. The tan colored limestone lies above the gray volcanic rock mound. Drilling down into the limestone reveals some fossil corals, etc., although they are poorly preserved, especially in the deeper regions of the reef.

CROSS-SECTION OF AN ATOLL



2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

Living reefs grow quite slowly and some are so huge that some scientists state that it would take well over a hundred thousand years or even much longer to grow them. The prime example is Enewetak Atoll that has a thickness of some **1405 meters** of apparent reef material.

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

Reports in the scientific literature suggest reef growth rates of **0.8 to 414 millimeters per year** and maximum coral growth rates of **432 millimeters per year**. [See p 235-241 of the book: **Roth AA. Origins: Linking Science and Scripture for references and discussion.**] The maximum rates would permit the growth of Enewetak in **less than 3500 years**, thus not challenging a recent creation. But one has to postulate optimum conditions throughout that time, especially at the surface of the ocean where reefs grow the fastest. Also coral could have grown faster in the past when we had less pollution. Other organisms could also be involved. Regardless, the proposed living reef problem is not a good argument against the Bible since potentially these thick reefs could have grown in just the few thousand years since the Genesis Flood.

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

In fact, reefs grow so fast that in the context of the very slow changes postulated over the long geologic ages, one can wonder why we have **drowned reefs**. Coral and algae require light to grow significant reefs and that light is only available near the surface of the ocean. There are many reefs around Enewetak Atoll and several of them lie down over a kilometer deep where there is virtually no light. It is reasoned that when these drowned reefs started growing, the volcanic rocks on which they grew were close to the surface and the volcanic layers gradually subsided as active growth kept the top of the reefs at the ocean surface. Some like Enewetak kept growing while others didn't and literally "drowned," likely because of lack of light.

2. TIME QUESTIONS ABOUT A RECENT CREATION

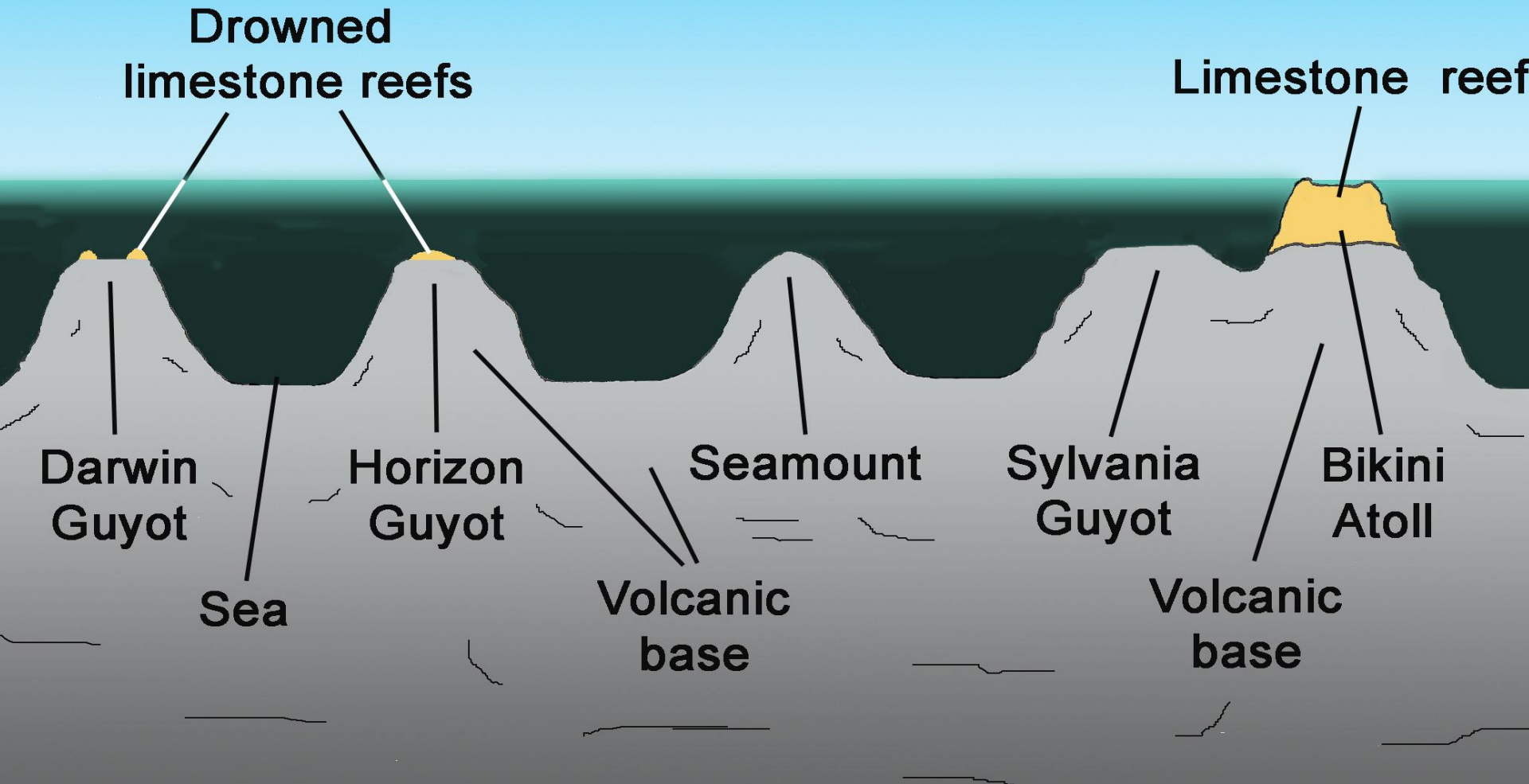
a. CORAL REEFS (Living Reefs, Continued)

A question for those who believe in the long geologic ages is that since at present the ocean floor sinks around 0.1 mm per year, while reefs grow at a rate of 1-424 mm per year, why do we have drowned reefs?

The next slide diagrammatically illustrates the relationship of drowned reefs to living reefs in the western Pacific. The “guyots” that are illustrated are large flat-topped volcanic mounds found in the ocean.

DROWNED REEFS

(Vertical exaggeration X 10)



2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Living Reefs, Continued)

A quotation from a geologist who does not believe in a recent creation is provided on the next slide. He raises the intriguing question of the drowned reefs. When he speaks of “1000 $\mu\text{m}/\text{yr}$ ” that is the same as 1 millimeter per year, etc., but also keep in mind that some reefs are reported to grow hundreds of times faster than the rate he proposes.

While a number of other factors could be involved in the conundrum of the drowned reefs, and we have much yet to learn about reefs, it is of interest that the more rapid geologic activity that would be associated with the Genesis Flood could resolve the slow rate of subsidence dilemma. That possibility is not considered in the quotation on the next slide.

Wolfgang Schlager. 1981. The paradox of drowned reefs and carbonate platforms. Geological Society of America Bulletin 92(4):197-211.

“The growth potential of 1,000 $\mu\text{m}/\text{yr}$ [1 mm/year] exceeds any relative rise of sea level caused by long-term processes in the geologic record. Newly formed ocean crust subsides at a maximum of 250 $\mu\text{m}/\text{yr}$ [1/4 mm/year], basin subsidence averages 10 to 100 $\mu\text{m}/\text{yr}$, [1/100 to 1/10 mm per year] and sea level rises due to increased sea-floor spreading amount to less than 10 $\mu\text{m}/\text{yr}$ [1/100 mm/year]. Rapid pulses of relative rise of sea level or reduction of benthic growth by deterioration of the environment remain the **only plausible explanations of drowning.”**

[These are not the “only plausible explanations” Rapid action associated with the catastrophic Genesis Flood is another explanation, that will be considered below.]

IN OTHER WORDS:

a. CORAL REEFS: (Living Reefs, Continued)

As noted in the previous slide, a geologist is puzzled by drowned reefs because the assumed geologic changes over long geologic ages, such as formation of the crust of the ocean and the sinking of the ocean floor, are assumed to be very slow. In that scenario, we should not have drowned reefs because reefs grow so fast, even though he assumes a very slow reef growth rate of only 1 mm per year. Recall that some reefs can grow as fast as 400 mm per year.

IN OTHER WORDS:

a. CORAL REEFS: (Living Reefs, Continued)

On the other hand, the drowned reefs may be evidence for rapid changes during or likely after the catastrophic worldwide Genesis Flood. Several models can be considered, but the data indicates that something very unusual happened. Water may have risen, or the floor of the ocean may have gone down so fast in some places, that the reef growth could not keep up, and some reefs “drowned” because of lack of light. These are only suggestions that need further authentication.

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. Coral reefs:

The fossil reefs

2. TIME QUESTIONS ABOUT A RECENT CREATION

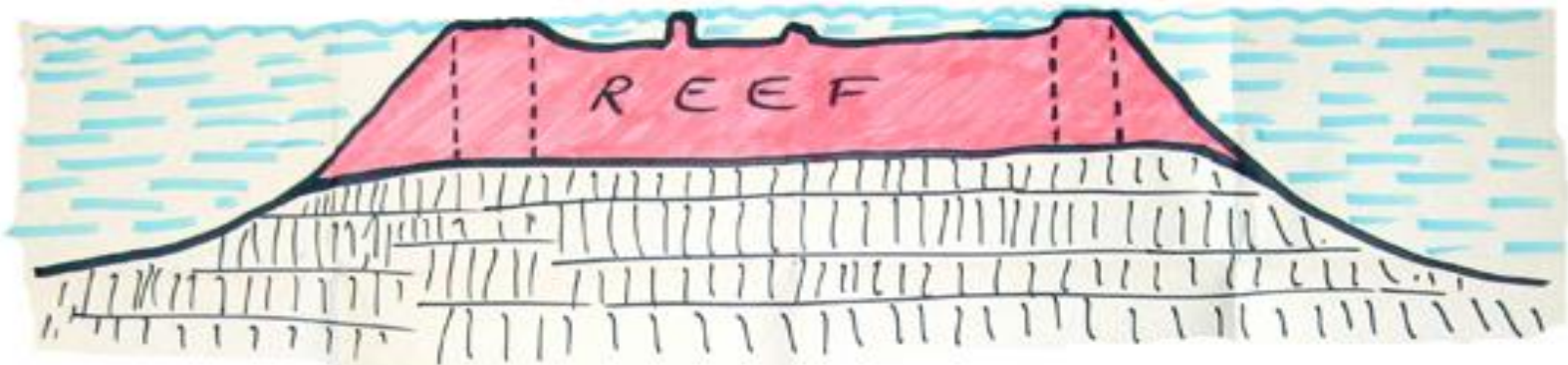
a. CORAL REEFS (Fossil Reefs)

We discussed living reefs above. Another challenge to a recent creation that is sometimes posed is the many fossil reefs reported in the geologic layers of the earth. They are dead and have been reported in many localities throughout the world. They would take considerable time to grow, especially where reefs are assumed to have grown one above another, and hence you would add up the time for each reef to grow.

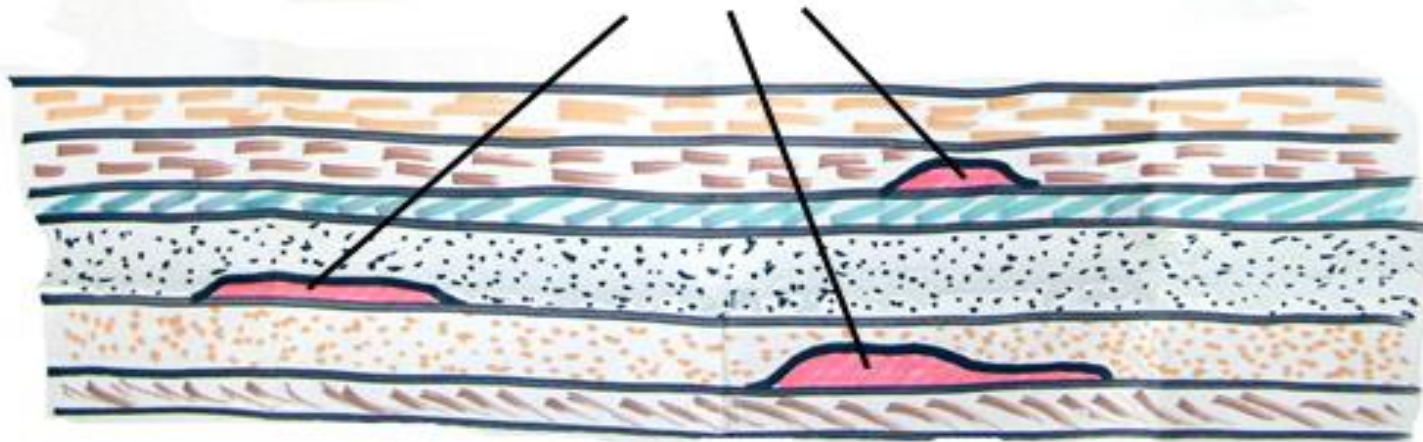
In the biblical model the fossil layers are considered to have been largely deposited by the great Genesis Flood. Hence the time question is: did these fossil reefs grow slowly over millions of years or were they formed or redeposited rapidly by the Genesis Flood.

The next figure illustrates the contrast between living reefs and fossil reefs as we see them now.

LIVING REEF



FOSSIL REEFS

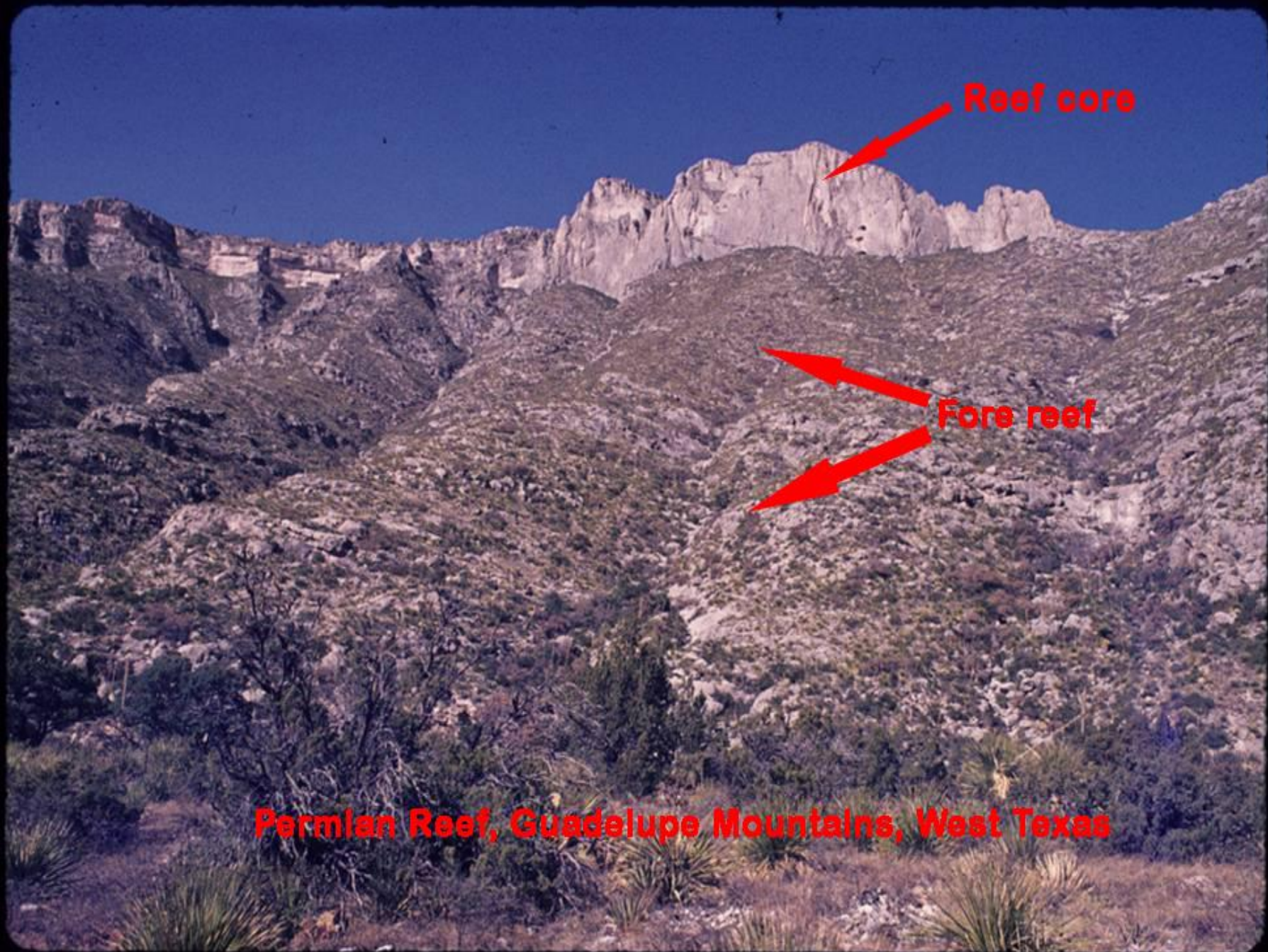


2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Fossil Reefs, Continued)

Most fossil reefs are much, much smaller than living reefs, and many are very small; some just a few centimeters in height are called fossil reefs. Their composition is also highly varied. The interpretation of many of these as representing real reefs is questionable [Roth AA 1995. Fossil reefs and time. Origins 22:86-104]. For instance the classic Permian Capitan Reef (next slide) does not have a coral framework, but has fossil sponges found in lots of fine lime mud. While some report that most of the sponges are upright, as if they grew there slowly forming a reef, others report that many of the sponges are upside down. Evaluation of the data suggests random orientation; as expected for a catastrophic flood deposit that did not grow there slowly as a reef.

The next slide is a view of the famous Permian Capitan Reef of the Guadalupe Mountains of West Texas. The assumed reef core is the high, light colored cliff below the skyline, while the assumed fore reef is the sloping layers below as seen in the picture. This reef is much, much larger than most fossil reefs, and what is called the fore reef is unusual and extremely large.



Reef core

Fore reef

Permiian Reef, Guadalupe Mountains, West Texas

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Fossil Reefs, Continued)

There are some fossil reefs that appear to be real reefs with their reef-forming organisms in a **dominantly upright position**. In a creation context, these may represent reefs that grew between creation and the Genesis Flood and were buried by that Flood. Some reefs, especially smaller ones, could have grown before the Flood and been moved around as **whole units** during the catastrophic Flood.

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS (Fossil Reefs, Continued)

Over two thousand structures have been identified as fossil reefs. Many are likely sedimentary mounds and not real reefs. Some are in the centimeters range in height and not time significant, while some are larger and some of those appear genuine.

The distribution of assumed reefs as one goes up through the fossil layers is not even, and one finds that they are more abundant in three regions. If these layers represent the general order of destruction expected for the gradually rising waters of the Genesis Flood, one can theorize that the lowest abundant group represents reefs at the lowest sea level before the Flood. The higher (middle abundant region) represents reefs of the Mesozoic seas (see Discussion 11, FOSSILS AND CREATION), while the highest group would represent reefs that grew after the Genesis Flood.

2. TIME QUESTIONS ABOUT A RECENT CREATION

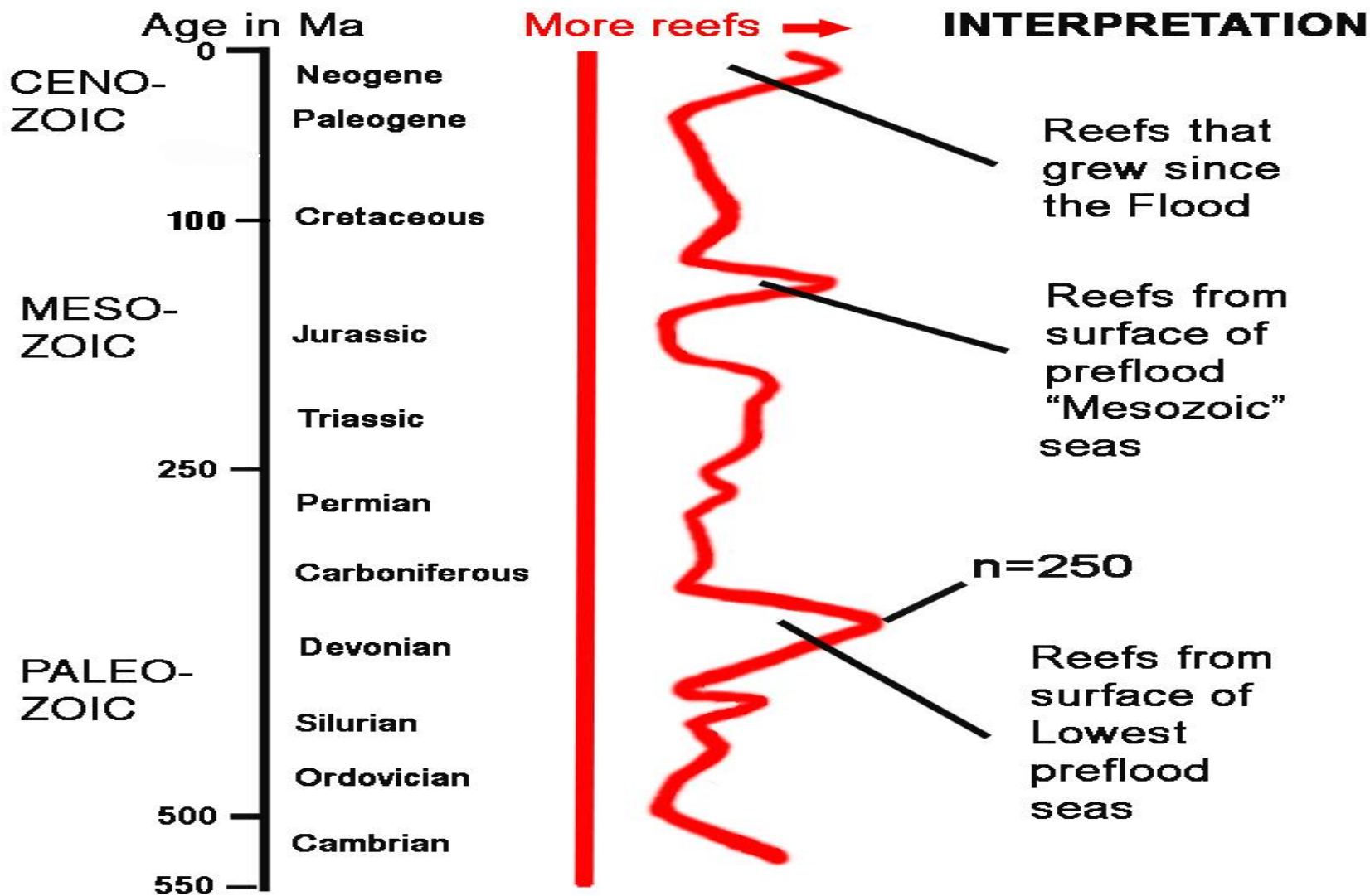
a. CORAL REEFS (Fossil Reefs, Continued)

This distribution of assumed reefs through the fossil layers is illustrated in the next slide. Keep in mind that the interpretations are only intriguing suggestions that need further validation. Furthermore, simple altitudinal interpretations through the geologic column may overlook other complicating factors such as varied localized lateral transport events expected during a worldwide Flood.

The ages in “Ma” (millions of years) at the left side of the slide are the assumed long geologic ages interpretation, and not at all the biblical model.

A likely biblical interpretation is depicted at the right. It involves relatively rapid events before, during, and after the Genesis Flood.

REEFS IN THE PHANEROZOIC



Distribution based on Kiessling, W. 1999. AAPG Bulletin 83: 1552-1587

2. TIME QUESTIONS ABOUT A RECENT CREATION

a. CORAL REEFS

SUMMARY ABOUT REEFS: Both living and fossil reefs are reported to pose a time challenge to the recent creation-Flood model (a few thousand years ago) of the Bible. It is argued that they would take too long to grow.

However, under ideal conditions, living reefs can grow fast enough to have been formed since the Genesis Flood. Many fossil reefs may not be true reefs while others may have grown during the time between creation week and the Flood and then been buried and even transported by that astonishing Flood. Reefs do not appear to be the serious challenge to the Bible that is sometimes claimed.

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. Ancient glaciations

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. GLACIATION

We often hear about various **ice ages**. Of themselves these are not a very significant time challenge to a recent creation. Their identification and correlation is difficult and frequently debated. You may have heard of **four** ice ages, but some talk about **thirty** of them. Ice ages are dated indirectly by other means and do not represent a reliable independent kind of time measuring clock; they may be only special deposits such as debris flows interpreted as representing long slow ice ages.

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. GLACIATION

Creationists usually speak of one ice age that occurred soon after the Genesis Flood, probably induced by increased precipitation and the occlusion of heat from the sun by volcanic dust from Flood activity, thus causing the temperature to drop and induce one major glaciation.

At present a significant proportion of the continents is covered with ice. Just the Antarctic and Greenland ice sheets cover more than **ten percent of the surface of the continents**. As illustrated by the picture in the next slide (Athabaska Glacier in Canada), there are other parts of the continents covered with ice.



Athabaska Glacier, Canada

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. GLACIATION

Recently a new challenge has been posed to a recent creation by **over a hundred thousand annual ice layers (varves)** found in the Greenland and Antarctic **ice sheets**. At these localities the ice reaches a total of three to four kilometers in thickness as it lies spread over the bedrock. The ice sheets consist of many widespread horizontal ice layers stacked up on top of each other. In the top region of an ice sheet, a single horizontal ice layer can be half a meter thick. Each ice layer is assumed to have taken a year to form. Ice layers are studied by drilling down into the ice sheet and taking core samples all the way down to the bedrock.

The fact that over a hundred thousand annual ice layers have been reported for an ice sheet is considered to strongly favor an evolutionary model because it challenges the Biblical model of a creation just a few thousand years ago. Closer inspection indicates that the challenge is not as objective as often claimed.

2. TIME QUESTIONS ABOUT A RECENT CREATION

2. GLACIATION

Climatic variation like storms can occasionally cause several layers of ice to appear in one year, but this is only a minor problem with these assumed annual layers of ice.

The best data is in the **top portion of the Greenland ice sheet**. There you can easily see thick layers of ice and oxygen isotope cycles that vary annually. There is more oxygen-18 compared to oxygen-16 in the summer ice, and each cycle of change is counted as a year. When you go down through several thousand layers it becomes harder to see the layers, so other methods such as oxygen isotopes, chemical tests, and especially dust distribution are used to try and identify the layers.

However, as one would expect, dust, that is assumed to be transported mainly in the springtime by wind, does not give well defined cycles, and frequently shows irregular patterns with several peaks of dust activity per assumed year.

2. TIME QUESTIONS ABOUT A RECENT CREATION

2. GLACIATION

The real problem is in the lowest layers, where you can no longer see the layers and other methods have to be used to try and determine annual changes. Furthermore, the further down you go the thinner the layers get because they are compressed by the load of the thick ice above. Towards the bottom, the layers reach an observed or assumed thicknesses that is only in the millimeter range.

Adding to the complications is the fact that it is often assumed that the bottom ice has flowed out laterally towards the edge of the huge ice sheets traveling along the bedrock. Things get very complicated at the base of these ice sheets, and this is where ages **greater than a hundred thousand years are proposed.**

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. GLACIATION

Accuracy of counting is highly questionable. One **500 meter thick sample in Greenland** gave **25,000 more years** to lower layers, when it was recounted by using a narrower laser beam (from 8 mm to 1 mm) for reflection used in dust detection. One can surmise that by narrowing down the laser beam some more, one could add many more years from dust irregularities. This **25,000 year** addition indicates how subjective some of these counting methods are. Extrapolation from present rates of accumulation and other indicators are also used to estimate the number of layers, but their reliability is even more questionable.

For much of the **Antarctic ice sheet** the **precipitation is so low** that annual layers are seldom detectable in the ice. There, estimates of the age of the ice are based mainly on broad **oxygen isotope variation** cycles in the ice that are correlated to marine sediment cycles and these are correlated to cosmological **Milankovitch cycles**.

2. TIME QUESTIONS ABOUT A RECENT CREATION

b. GLACIATION

The Milankovitch cycles, that are up to **several hundred thousand years** each, assume differences in solar radiation received by the Earth due to minor changes in Earth's rotation patterns. These larger cycles can suggest ages of ice of **400,000 to 700,000 years**. The significance and especially the validity of the Milankovitch cycles is severely challenged in some of the scientific literature. To put it plainly, this is a lot of indirect data based on speculations and not direct validation.

As mentioned above, creationists propose one rapid glaciation event caused by the aftereffects of the Genesis Flood. Those unusual conditions likely produced the lower part of the Greenland and Antarctic ice sheets.

In summary, at present, the glacial varve problem for a recent creation appears to be based on an inordinate complex of conjecture.

For further discussion see the book: **Oard MJ. 2005. The Frozen Record: Examining the ice core history of the Greenland and Antarctic ice sheets. Santee, CA: ICR (now in Texas).**

2. TIME QUESTIONS ABOUT A RECENT CREATION

**c. Radiometric dating:
carbon-14, potassium-argon**

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING

- Rocks and fossils are sometimes dated by using the **slow decay rate** of unstable radioactive atoms. The more decay found in a sample, the older it is assumed to be.
- Radiometric dates provide the backbone for the long geologic ages generally accepted by the scientific community.
- Radiometric dates are considered by a number of scientists to be the strongest evidence there is against the biblical account that life on earth was created recently by God.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING

- While many radiometric dates do **not agree** with long geological ages, many do. For instance many published radiometric dates **get progressively younger** as you go up the geologic column as illustrated by the layers of the Grand Canyon in the next slide. The low Cambrian layers in the Grand Canyon are dated at around 550 million years, while the top layer dates at around 240 million years. However, volcanic rocks just on top of all this to the west of this locality that should be younger can give dates as old as 2600 million years. The “Ma” on the slide stands for “millions of years (a=annum=year).”
- We will consider two radiometric dating systems: **Carbon-14 and potassium-argon dating.**

← ■■■■ 2600 Ma

← 260 Ma

← 350 Ma

← 550 Ma

Grand Canyon, Arizona



2. TIME QUESTIONS ABOUT A RECENT CREATION

c. Radiometric dating:

The Carbon-14 dating system

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING: CARBON-14

HOW CARBON-14 DATING WORKS

- Carbon-14 is formed in the atmosphere from nitrogen-14 by cosmic rays. It is rare.
- It becomes mixed in with the regular carbon-12 of the air and into living organisms as carbon dioxide is absorbed by plants, and then animals eat the plants.
- Carbon-14 dating is used almost exclusively for things that have been alive.
- Carbon-14 is unstable (i.e. radioactive) and slowly changes back to nitrogen-14.
- **So the less carbon-14 you find in a fossil the older it is.**

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING: CARBON-14

- The time for half of the carbon-14 atoms in a sample to change to nitrogen-14, i.e. the half life, is about **5730 years**.
- In another half life after the first, i.e. 5730 years later, half of **what is left** will change to nitrogen-14, so 1/4 of the original carbon-14 will remain, and after another 5730 years 1/8 will remain, etc. This is an exponential curve.
- Because of constraints on detection and contamination, carbon-14 dating is considered **valid only to a maximum of 80,000 years**. It is usually not used to date the old rock layers of the earth where millions of years are suggested.
- Many carbon-14 dates of fossils are **older than the approximate 6000 year** creation date inferred from the Bible. This is considered to be a problem for a recent creation, but there are reconciling explanations.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: CARBON-14 (Continued)**

- The next slide summarizes conflicting published results for the dating of ancient man in North America using various dating techniques. You may want to study the data carefully. In the table, **AAR** = amino acid racemization, which uses slow changes in amino acids to date samples. **AMS** = accelerator mass spectrometry, which is a newer more precise method of carbon-14 dating.
- Note the major discrepancies between the “original” and “revised” estimates. While the older methods gave average dates for ancient man in North America of more than **28,000 years**, the revised dates averaged less than **4,000 years**.
- Also note near the bottom of the chart the major revision of dates in two pairs of carbon-14 dates, from 23,000 and 14,000 to 3,560 and 5,000 years. Not all published dates vary this much. Keep in mind that radiometric dating is complex and many times it is conflicting.

**MAJOR REVISIONS IN THE PLEISTOCENE AGE ASSIGNMENTS
FOR NORTH AMERICAN HUMAN SKELETONS**

From: Taylor, RE et al. 1985, American Antiquity 50(1):136-140

SKELETON	TECHNIQUE	ORIGINAL ESTIMATE	AMS REVISED C-14 ESTIMATE
Sunnyvale	AAR U-Series	70,000(?) 8,300-9,000	3,600-4,850 6,300
Haverty	AAR AAR	>50,000 2,800-48,000	4,050-7,900
Del Mar	AAR U-Series	41,000-48,000 11,000-11,300	4,900
San Jacinto	AAR	37,000	3,020
Otavalo	Thermoluminescence AAR	25,000 ~28,000	2,300-2,670
Taber	Geological correlation	22,000-60,000	3,550
La Jolla Shores	AAR	28,000	1,700-1,930 4,820-6,330 5,600
Los Angeles	C-14 AAR	>23,600 26,000	3,560
Yuha	AAR U-Series	23,600 5,800	1,650-3,850
Truckhaven	AAR	23,600	<500
Laguna	C-14	>14,800-17,150	5,100

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING: CARBON-14 (Continued)

- The major problem for carbon-14 dating is determining what was the **original concentration** of carbon-14. **If lower than an assumed normal concentration, things would date too old; if higher, they would date too young. Remember, the less carbon-14, the older the sample.**
- For instance, some living snails in Nevada date at **27,000 years** because they grow in an aquatic environment that is very low in carbon-14. Most living **marine organisms** date several hundred years old because there is proportionately less carbon-14 in the ocean than in the earth's atmosphere. The present concentration of carbon-14 in the atmosphere is often used as a general reference point for dating purposes.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: CARBON-14** **(Continued)**

- But could the concentration of carbon-14 in the atmosphere have **varied in the past**? A great deal of effort has been put forth in trying to determine this. Both evolutionists and creationists adjust the raw data of carbon-14 because of this. The evolutionists adjust it a little, and creationists postulate major changes especially associated with the Genesis Flood. Creationists propose that **before the Flood there was little carbon-14**, thus giving apparently very old ages. After the Flood, the concentration of carbon-14 **gradually increased**, providing the gradually younger carbon-14 dates we find.

2. TIME QUESTIONS ABOUT A RECENT CREATION

C. RADIOMETRIC DATING: CARBON-14 (Continued)

- While a lot of recent carbon-14 dates **generally agree** with **recent** accepted historical dates of a few thousand years ago, some **do not**.
- On the other hand, as mentioned earlier, a lot of carbon-14 dates are older than the few thousand years since creation as indicated in the Bible. Creationists explain these older dates by suggesting that the concentration of carbon-14 in the past was lower than at present, thus giving apparent older dates.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: CARBON-14 (Continued)**

One of the peculiarities of carbon-14 dating is that because the half life of carbon-14 is so relatively short, i.e. 5730 years, its presence in very ancient fossils suggests that these fossils are not as old as claimed. If they were really hundreds of thousands to millions of years old, there would not be any carbon-14 left in them. Hence while carbon-14 can suggest older dates than the Bible does, it can also suggest much younger dates than the millions of years proposed for geologic time. We will discuss that in the next discussion: THE GREAT TIME QUESTIONS, Part 3: Data Favoring a Recent Creation, in the section titled “Ancient Carbon-14.”

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: CARBON-14** (Continued)

SUMMARY FOR CARBON-14 DATING

There are many complicating factors associated with carbon-14 dating.

Creationists generally agree with the carbon-14 historical dates that are only a few (3-4) thousand years ago, but they also recognize significant discrepancies. Older dates are generally explained on the basis of a lower concentration of carbon-14 in the past, especially before the Genesis Flood. In other words, there was **considerably less carbon-14 in the atmosphere at that time** than in our present atmosphere. That lower concentration would give inordinately older dates. Evidence associated with that lower concentration will be considered in the next discussion

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. Radiometric dating:

**The Potassium-argon dating
system**

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: POTASSIUM-ARGON DATING**

The next slide is a view of the small volcano Rangitoto on the coast of the North Island of New Zealand. It is the low, broad cone designated by the green arrow.

Lava flows from Rangitoto contain some wood that dates at **less than 1000 years old** by carbon-14, while dating the lava flows by the potassium-argon method gives dates as high as **465,000 years**.

The lava flows are believed to be less than a thousand years old, based mainly on the carbon-14 dating. The potassium-argon method is believed to be in error, because of **the excess argon problem**, which can make rocks appear to be much older than they are.

This illustrates one of the basic complications of **potassium-argon dating**.



Rangitoto Volcano, New Zealand

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING: Potassium-Argon Dating (Continued)

THE METHOD:

- **Potassium-40 is an unstable (radioactive) kind of atom found in some minerals. It changes (actually, only a constant proportion) very slowly to argon-40 that is a gas.**
- **By comparing the amount of potassium-40 to the amount of argon-40 one can tell how old a rock is.**
- **The more argon-40 compared to potassium-40 the older the sample.**

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: Potassium-Argon Dating** (Continued)

THE METHOD:

- The change from potassium-40 to argon-40 is very slow. In **1,280 million years** half of the potassium-40 will have changed (in part) to argon-40, and 1,280 million years later, half of what remains or 3/4 of the original potassium- will have changed (in part) to argon-40, etc.
- Unlike carbon-14 it can be used to get very old dates because the change is so slow.
- The method is important and has been the basis for establishing the age framework of the geologic column. Other methods are also used.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: Potassium-Argon Dating (Continued)**

- The main problem with potassium argon dating is the presence of **excess argon**. This common gas is found in air and in rocks and can easily confound the dating system. An excess of argon gas results in older dates. The escape of argon also occurs and produces younger dates.
- Nevertheless, **a lot of published potassium-argon dates agree with the standard geological time scale**, and this is a problem that needs to be addressed further by those who believe in a recent creation. We will provide some suggestions a little later below.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: Potassium-Argon Dating** (Continued)

- The dating systems are complex and many factors can change the dates, and **there is no shortage of anomalous dates** that are explained in various ways by long age geologists.
- That there is **selection of dates is acknowledged** by the geological scientific community. The quotation in the next slide illustrates this. How significant the selection of data factor is in the scientific literature remains unknown.

Forster SC, Warrington G. 1985. Geochronology of the Carboniferous, Permian and Triassic. In Snelling NJ editor. The Chronology of the Geological Record. London: Blackwell Scientific Publications, for the Geological Society, p 99-113.

“A large number of age determinations on rocks of Carboniferous to Triassic age have been published. In this review, the radiometric data available in nearly 500 separate articles have been examined by the senior author (S. C. Foster) and , following application of the above criteria, only 45 dated items (Fig. 1) have been accepted from this voluminous literature as suitable for time-scale purposes.”

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING: Potassium-Argon Dating (Continued)**

- The **Genesis Flood** was a comprehensive and universal event. Such an event would be expected to affect dating systems in a variety of ways. Some suggestions are:
- The **pressure** of the overlying waters of the Flood would be expected to trap excess argon in molten rock, as has been well demonstrated in modern underwater lava flows into the ocean in Hawaii (*Science* 161:1132-1135). This system would produce a sequence of potassium-argon dates from older to younger. The higher pressure at the bottom **would entrap more excess argon**, resulting in older dates there; then you would have gradually younger dates as you go up since the pressure of water decreases as you go up toward the surface. The pressure of the Flood waters might explain a number of dating sequences.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. **RADIOMETRIC DATING:**

Potassium-Argon Dating (Continued)

- An event like the Flood would be expected to **release trapped helium and argon** from Earth's mantle, and some studies reveal that excess amounts of these gases are more abundant in the lower rocks (*American Mineralogist* 43:433-459), thus suggesting another cause for older dates lower down.

2. TIME QUESTIONS ABOUT A RECENT CREATION

C. RADIOMETRIC DATING: Potassium-Argon Dating (Continued)

- **Volcanoes**, that normally spew hotter and hotter lava as eruption proceeds, could simulate dating sequences towards younger dates in higher layers in just one eruption on a local scale. The hotter lava would get rid of more excess argon than cooler lava, thus giving apparently **younger dates as eruption proceeded**. Remember that the less argon, the older the sample dates. (See **Roth 1998 Origins**, p 253 for references).
- If the matter of the Earth was here before creation week, some of the older minerals, providing old radiometric dates, could have become **incorporated into younger rocks** during the Flood cataclysm, thus giving apparent older dates for younger rocks.

2. TIME QUESTIONS ABOUT A RECENT CREATION

c. RADIOMETRIC DATING:

CONCLUSIONS ABOUT POTASIMUM-ARGON DATING

There are many complicating factors. Some creationists suggest that the rate of radioactive decay could have been different in the past, but evidence for that is sparse.

Creationists can explain ordered sequences of dates as due to the pressure of water depth, cooling, or degassing from deeper rocks. Older dates in younger rocks could also come from intrusion of “older” rock material from lower layers that became mixed with younger ones. Because so many factors are involved, all conclusions should follow careful study and still be viewed with caution.

**3. CONCLUSIONS:
QUESTIONS ABOUT A
RECENT CREATION**

3. CONCLUSIONS

Coral reefs, glacial varves, and radiometric dating are presented as challenges to a recent creation. The first two are replete with problems, and there are complications and some reasonable alternatives to the long radiometric ages proposed. These alternatives fit within the model of a recent creation followed by Flood activity.

If the matter of the Earth existed for a long time before creation week, this can explain, within a recent creation context, some of the older radiometric dates in deep rocks. Also during the Genesis Flood, the material from some of these deep rocks could provide older inherited dates into younger deposits as intrusion of molten rock or various sources of sediments were mixed up. The great catastrophic Genesis Flood can account for a number of factors purported to demonstrate long ages.

4. REVIEW QUESTIONS

(Answers given later below)

4. REVIEW QUESTIONS – 1

(Answers given later below)

- 1. Why are living and fossil coral reefs not a good challenge to the biblical model that creation was only a few thousand years ago?**
- 2. Glacial layers (varves), assumed to be annual, are suggested as a severe challenge to the idea of a recent creation a few thousand years ago. Why is this not the challenge claimed?**

REVIEW QUESTIONS – 2

(Answers given later below)

- 3. What is the major problem with carbon-14 dating? How are the dates affected by this problem?**
- 4. What is the greatest problem with potassium-argon dating? How might the Genesis Flood have affected these dates?**

REVIEW QUESTIONS AND ANSWERS - 1

1. Why are living and fossil coral reefs not a good challenge to the biblical model that creation was only a few thousand years ago?

Under the right conditions, present living reefs could form in a few thousand years, because some coral and reefs can grow faster than 400 millimeters a year. Many fossil reefs may not be true reefs while others may have been formed between creation week and the Flood and transported and/or buried by that Flood.

2. Glacial layers (varves), assumed to be annual, are suggested as a severe challenge to the idea of a recent creation a few thousand years ago.

Why is this not the challenge claimed?

Good distinct layers are not seen in the lower layers of the Greenland ice sheet. Below that the data is even less clear and confounded by lateral and irregular flow and compression. Only rarely do good layers form in Antarctica, and age determinations are based on a number of tenuous and sometimes controversial assumptions.

REVIEW QUESTIONS AND ANSWERS – 2

3. What is the major problem with carbon-14 dating? How are the dates affected by this problem?

The problem is determining what was the original concentration (proportion) of carbon-14 in the atmosphere or water in which the organisms grew in the past. If the concentration was low it would give older dates, if high it would give younger dates.

4. What is the greatest problem with potassium-argon dating? How might the Genesis Flood have affected these dates?

Excess argon that is already present. This gives older dates because the more argon the older the sample dates. During the Genesis Flood the hydrostatic pressure of the flood waters could have prevented escape of the excess argon. The deeper one goes the greater the pressure, thus giving older and older dates to the deeper layers.

ADDITIONAL REFERENCES

For further discussions by the author (Ariel A. Roth) and many additional references, see the author's books titled:

1. **ORIGINS: LINKING SCIENCE AND SCRIPTURE.** Hagerstown, MD. Review and Herald Publishing Association.
2. **SCIENCE DISCOVERS GOD: Seven Convincing Lines of Evidence for His Existence.** Hagerstown, MD. Autumn House Publishing, an imprint of Review and Herald Publishing Association.

Additional information is available on the author's Web Page: Sciences and Scriptures. www.sciencesandscriptures.com. Also see many articles published by the author and others in the journal **ORIGINS** which the author edited for 23 years. For access see the Web Page of the Geoscience Research Institute www.grisda.org.

Highly Recommended URLs are:

Earth History Research Center <http://origins.swau.edu>

Theological Crossroads www.theox.org

Sean Pitman www.detectingdesign.com

Scientific Theology www.scientifictheology.com

Geoscience Research Institute www.grisda.org

Sciences and Scriptures www.sciencesandscriptures.com

Other Web Pages providing a variety of related answers are: Creation-Evolution Headlines, Creation Ministries International, Institute for Creation Research, and Answers in Genesis.

USE PERMIT

Free unrevised use for personal and non-commercial distribution of this material in its original publication medium is granted and encouraged. Proper attribution should be given. Permission for multiple printing for classroom use or not-for-profit public meetings is also freely allowed.

In using this material in this format, accurate attribution should be maintained for any illustrations where credit is designated. Many illustrations are by the author and free use is granted for all media. However, when credit to another source is given, permission might be necessary from the source for certain different kinds of communication media than the present use.