

Talk #1 Paleontological Molecules and Soft Tissues:

Introduce situations or challenges regarding your topic that teachers, chaplains and pastors will be facing in the South Pacific.

Postulated long ages for life on earth, supported by radiometric dating, are currently one of the biggest scientific challenges to a straightforward belief in the biblical narrative of a recent creation and global flood. Science and social science education starting with very young children discuss earth and human history in millions and hundreds of thousands of years, mostly due to the requirements of long ages for evolution, and radiometric dating techniques that supply those old dates. However, these ages are in direct contradiction to the biblical narrative. Youth receiving only secular education are lead to believe that there is significant, unequivocal, irrevocable, and all-encompassing scientific and anthropologic evidence that the time periods (and events) given in their text books are proven facts. Because this information is presented as “fact” so early in a child’s education, the child has no grounds to even know to question what is presented.

One hypothesis about why Christian young people might give up on creationism:

The models presented as fact in text books give youth a strong sense of having ‘complete comprehension’ and thus is an attractive worldview for them to adopt, especially with an increasing lack of stability in their personal or home life in present generations. In my experience as a university instructor, I have found that teens are very uncomfortable with “Science doesn’t know yet” answers, and they will gravitate toward what they perceive as solid truths (just ask a teen – really, they *know* everything; that is, I believe young people adopt very ridged truth structures in their search for stability while they themselves are in a constant state of change; this emphasizes the need for a strong and stable family structure in order for teens to safely navigate ‘unknowns’ during these years). Evolutionary theory is presented as a solid truth that teens can always depend on, and it then serves as a structure to fit all the facts of science and history onto. It is often that during these years a belief in evolutionary theory is adopted as a worldview for young Christians. In my experience, I see this need for ‘absolute stability’ begin to soften during a young person’s mid 20’s; to the point that young adults are able to receive a graduate science education, where getting a PhD in science results in the dawning comprehension and acceptance of the reality that science actually knows very little about only a few things, and it is a scientist’s privilege to research for more information. Unfortunately, by this time, young adults have often already embraced evolutionary theory, and to challenge it not only destroys the stability of their world but probably would end their science career. Therefore they often are not even willing to consider scientific evidence against evolutionary theory.

Interestingly, most young scientists are trained to investigate processes that are observable in the laboratory; evolution usually is not studied that way. Thus, young scientists often do not actually investigate evolutionary theory to see if it is supported by actual data/experimentation because they never have to deal with it in their own line of research. This was exactly my

experience. To exemplify this point, most research taking place in laboratories around the world is funded by a government, and governments around the globe are *most* interested in curing diseases that are plaguing their populations and costing the government money. Thus the research that gets done is often on health crises like Covid, cancer, heart disease, diabetes, obesity, health disparities, etc., none of which really ever deal in evolutionary theory; evolution is merely an assumed fact in these fields. Therefore students proceed in their belief that evolution is completely supported by experiments (that is, by someone *else's* experiments) and hardly ever take the time, as a now-mature scientist, to investigate their long-held assumptions.

In text books for young, up to ages 20, unless a science student is reading about how organs function, or the cell structure, or viral life cycles, etc., many statements about evolution are only someone's *theories* that are written out as if they were *facts*, but the statements themselves actually lack a basis in original research and most lack supporting evidence. Therefore, youth are being taught only a *worldview*; which incidentally, is one without a God.

Text book authors are able to get away with writing sentences that scientific publications are not allowed, that is, text books typically do not have citations for every stated fact. The following is a sentence from a recent peer-reviewed publication from the lab where I do research: "Whereas the N-cap of PaPAS forms a well-defined $\alpha\alpha'$ helix (Sawai et al., 2012; Airola et al., 2013a), that of PAS2-W276L continued the extended structure of the β strand to end in a disordered region (Fig. 7A and B)" (Greer-Phillips et al., 2022). Note that we have both citations and references to figures of the original research presented in the paper to support the statement. Nearly every sentence in a modern peer-reviewed publication requires this amount of citation and support. However, when authors are making statements about evolutionary theory, those statements are usually devoid of citation; at best, a citation might be given for the person who first gave the theory, but usually there is no original research paper cited, because there is not actually any original research paper *to* cite; what is said in those statements does not have an original research paper showing that it is supported by evidence; instead the statements are supported by a consensus of belief among scientists.

For an example, a 2017 paper that showed fossils could be created in a laboratory, states the problem I articulated above. "Belief that wood petrification may result either from permineralization or replacement has long been perpetuated by teachers and textbook authors, but these explanations of wood silicification are seldom accompanied by supporting evidence" (Mustoe, 2017, emphasis added).

Body: Provide the scholarly and technical content which will explore the issues and develop viable solutions and strategies.

Collectively, text books on biology and geology point to fossils as one of the evidences of the evolution and long ages. Current radiometric dating techniques have been used to put the beginning of Cambrian explosion (the sudden occurrence of fossils in very low rock layers with

no substantive fossils below) at up to 543 million years ago. These long ages are, for the most part, supported by radiometric dating. Interestingly, long ages were also postulated by the initial Darwinian theory to be needed for the changes in DNA that would be necessary if the theory of evolution was true. So at the onset, evolutionary theory needed very long ages. Radiometric dating techniques were developed post Darwin's need for long ages; and helpfully, dating rocks with radiometric techniques *give* long ages – though do note that there are significant questions and assumptions that are made when radiometrically dating rocks as covered by other papers from this conference.

Dinosaur fossils are deposited in rock layers estimated to be in a range of 252 to 66 million years old (USGS). It should be noted that the fossils themselves are not that material that is “dated.” Instead, igneous rock layers (typically ash layers from a volcanic explosion) that lie above and below the fossils remains are dated. For the most part, it happens that some specific and unique fossil organism is found, the ash layers above and below that set of bones is identified and radiometrically date and an age range is established for the area between the ash layers that contains the bones. If the fossil is widely distributed, but usually only found in those unique rock layers, it becomes the *identifier* for that rock layer around the globe and is referred to as an “index fossil” (“ThoughtCo.com;” for a list of useful index fossils see “USGS Index Fossils”). It then follows that rock layers themselves are identified and given ages based on the fossils found within them, even though the fossils themselves are not dated using radiometric techniques.

The lay definition of fossils is that they are “the preserved remains, or traces of remains, of ancient organisms. Fossils are not the remains of the organism itself! They are rocks.” (National Geographic). The process call “permineralization” together with “replacement” are thought to be the mechanisms by which a dead organism ceases to be protein, bone, and fat and becomes a rock. Permineralization indicates that “After a bone, wood fragment, or shell is buried in sediment, it may be exposed to mineral-rich water that moves through the sediment. This water will deposit minerals, typically silica, into empty spaces [in the tissue and bones of the dead animal], producing a fossil” (General Biology 2022), or in the case of replacement, the minerals begin to crystalize where the tissues are being degraded away, in essence the minerals replace the areas that were once organic. Thus, the three dimensional area that previously was bone or soft tissue gets preserved in perpetuity as a hard and durable mineral (“rock”), allowing scientists to touch and study the bones, anatomy, and body plan. Fossilization processes have been replicated in the laboratory, and have been utilized to fossilize soft tissues in a relatively quick time frame, such as weeks (Oehler et.al.,1971; Briggs and Kear, 1993; Townson et.al., 2014).

Often there is mention of “soft tissue preservation” in a fossil, which typically indicates you can see where the organs, skin, or feathers (the “soft” tissues, not bone), were located. These “soft tissues” leave an impression in the mud around the animal where the feathers or hair might have been, or a stain on the rock (and often a unique chemical signature), or are the mineral-replaced three dimensional remnants in the exact pattern where the internal organs were

located, and they can be identified. However, being able to visualize where the soft tissues were located and which organs were present in the organism is not the same as seeing the actual original soft tissues still on the rocks and in the fossil itself. That is where our story picks up: What is truly unique about the following data, is that we will see numerous examples of actual “original tissue,” which is, the discovery of the original proteins, fats, carbohydrates, and even nucleic acids that made up the body of ‘fossilized’ animals. Palaeontologists are now actually finding the true *remains* of an animal – not just the fossils!

Let’s discuss some characteristics of tissues and organs in animals. Living tissue is a fragile thing that requires constant vigilance to maintain and protect. Your body is constantly repairing DNA and proteins, laying and re-laying down of bone mineral in the constant “housekeeping” functions that your cells carry out moment by moment to maintain life (NCBI Housekeeping Genes). Upon death, tissue becomes a commodity for consumption to outside, or internal, organisms. These consumers include scavengers, invertebrates, and microbes.

Taphonomical research shows that very quickly after death soft tissues are nearly completely consumed away in a body exposed to the environment. Essentially there is nothing left of internal soft organs. For example, there is nothing but “soup” inside a fish after 5 days postmortem in sea water (Clements, et al., 2022). Bones are disarticulated, dried, and degraded away to nothing within relatively short time frame (Tiago Souza; forensic taphonomist, personal communication). Complete bone degradation can occur in less than 100 years due to the action of fungi (Nicholson, R.A 1996, Nicholson, R.A 1998). Burial of a body will protect it from scavengers, but burial cannot protect it from microbes like fungi mentioned above; microbes are by far the most efficient decomposers of organic material.

Burial in an *anoxic* environment is widely postulated to prevent decomposition of animal carcasses long enough for the fossilization process to take place, and is nearly always given as the explanation soft tissue fossilization. However, microbiologists recognize that microbes are excellent consumers, regardless of the presence of oxygen and regardless of burial! Therefore, the idea that merely being buried in an environment that lacks oxygen, is not a sufficient explanation to prevent soft tissue degradation. Carcasses of crabs and worms buried in sediment were destroyed within 25 weeks (Allison, 1988). Microbes (especially those found in the intestines of animals) grow well in anoxic environments and readily consume all available oxygen and energy sources (like organic material). Because of these realities, it is unlikely that organic material would be found in the bodies or bones of animals postulated to have died long ago.

Organic materials like fats, proteins, chains of nucleic acids, and the chains of carbohydrates that make up living tissue also have measurable *half-lives*. This means that even without being consumed by something else, these types of molecules spontaneously disintegrate over time unless they are repaired and replaced regularly. The time that these macromolecules and proteinaceous tissues persist after death has been estimated, and measured. Degradation of proteins varies with ambient temperature, but is estimated that 50% of all collagen (protein

that is in bones, connective tissue, and wraps around nerves and muscles, which is very prevalent in a body) would degrade in 2000 years at 20° Celsius, that is: at 20° Celsius the half-life of collagen is 2000 years (Buckley, M., *et al.* 2008). So within 6000 years only 6.25% of the original collagen would be present in a body or bones; remembering that this number is assuming a sterile environment, without any microbial consumption or decomposition. If temperatures were colder, like 7.5° Celsius, the half-life of collagen increases to 130,000 years (Buckley, M., *et al.* 2008); at this temperature it would take 1 million 40,000 years for the amount of collagen left in the bones to be only 0.2% of the original amount. This is not a lot of time considering dinosaur bones are estimated to be at least 66 million years old. Spontaneous degradation makes it very unlikely that organic material would be found in the bodies or bones of long dead animals.

Despite the realities outlined above, abundant *original* soft tissues (organic material), including some that retain the structure, flexibility, and sequence of the original have been found in the bones and tissues of fossils.

The most pertinent discovery of original soft tissue is that of *Tyrannosaurus rex*, published and popularized by paleontologist Dr. Mary Schweitzer of North Carolina State University (USA). It was through a set of accidental circumstances, that Dr. Schweitzer found blood vessels, blood cells, and original collagen within the bones of *T. rex*; the collagen even retained its 'snap-back' elasticity (Schwitzer, et. Al., 2005; for popular review see Smithsonian, 2006).

The discoveries by Mary Schweitzer and her colleagues were initially, (and at some level, continue to be) dismissed by the scientific community because, in her own words, "I just got goose bumps, because everyone knows these things don't last for 65 million years." She recalls, "I had one reviewer tell me that he didn't care what the data said, he knew that what I was finding wasn't possible. I wrote back and said, 'Well, what data would convince you?' And he said, 'None.'" (Yeomen 2006) The initial challenge to her discoveries was the suggestion that her samples were contaminated, which was followed by the suggestion that what she was seeing was only bacterial biofilms (Kayne et, al., 2008). So Dr. Schweitzer conducted new research that refuted that challenge (Schweitzer et, al., 2016). She continues to discover more and more soft tissues in dinosaur bones. Below are the major examples of the ongoing discoveries by Dr. Schweitzer and her colleagues:

- *T. rex* soft tissues retain some of the original flexibility, elasticity and resilience. (Schweitzer et.al., 2005)
- "Flexible and fibrous bone matrix; transparent, hollow and pliable blood vessels; intravascular material, including in some cases, structures morphologically reminiscent of vertebrate red blood cells; and osteocytes [bone cells] with intracellular contents and flexible filipodia" in *T. rex* (Schweitzer et.al., 2007)
- "Well-preserved tissues and primary collagen sequences from the femur of an 80-million-year-old hadrosaur [herbivore duck-billed dinosaur] (Schweitzer et.al., 2009)

- Blood vessels and osteocytes from a turtle in the paelocene-eocene era (33.9 to 66 million years ago) (Cadena and Schweitzer, 2014)
- Evidence of Keratin (the protein that makes up feathers, hair, fingernails, and the waterproof layer of skin cells) and melanosomes (pigment containing cells in humans and animals) from 130 million year old bird (Pan et.al., 2016)
- For a review of soft tissue preservation from animals postulated to be from 252-66 million years old, see Schweitzer, 2011.

The Mary Schweitzer's work was not the first to find original soft tissues in long dead animals, but was the first to be widely recognized and responded to by the paleontological community. Other research groups are finding the similar results. Drs. Brian Thomas and Joel Tay (of the Institute for Creation Research, ICR), have generated a continually updated list of peer-reviewed research articles documenting the finds of original soft tissue in presumed ancient animals. These papers chronical not only Schweitzer's work, but research published by other groups as well (Thomas and Tay). The list currently has 122 original peer-reviewed research papers.

Dinosaur bones have been around for a long time, so why is it that we are only now finding that they contain remnants of the original animal material? I think we can start to see the answer in the below statement:

“The reason it hasn't been discovered before is no right-thinking paleontologist would do what Mary [Schweitzer] did with her specimens. We don't go to all this effort to dig this stuff out of the ground to then destroy it in acid.”

Thomas Holtz Jr., Dinosaur paleontologist of the University of Maryland (Smithsonian 2006).

“No one would think to do what Mary did...” It turns out that Mary only accidentally did what she did. According to her own explanation, the dinosaur bone sample degraded too quickly in the acid bath she was using to erode away what she planned to be only the outermost mineralized bone layer. However, *all* the hard bone mineral dissolved, but instead of everything being gone, she found the acid-resistant collagen matrix still there in her bone sample! It wasn't replaced, nor permineralized, it was original protein from the animal. When she looked at that under the microscope she found blood vessels, elastic collagen, and what appear to be blood cells. In other papers, Dr. Schweitzer verified that these were collagen proteins by use of specific antibodies that only attach to collagen.

Dr. Holtz Jr. is articulating another outcome of a strictly evolutionary worldview: no scientist would look for what they have already decided cannot exist. This is why even trying to do carbon dating on dinosaur bones is nearly impossible; labs refuse to process the samples. The scientists running the 14-carbon labs know dinosaur bones cannot have 14-carbon because they are too old to retain any 14-carbon according to evolutionary theory. And this is why Drs. Leonard Brand and Sarah Maithel are finding evidence throughout sandstones that indicate huge portions of the Western USA were under water, even though for all the years that

geologists have studied these sandstones they are always been cited to be *desert* structures; because those sandstones are old desert dunes, not underwater dunes according to standard geological ideology, so no one would even see, nor investigate, the rocks with evidence for water deposition (personal communication to L. Brand from secular geology colleague).

At this point the scientific community has mostly shifted its efforts away from trying to disprove what Dr. Schweitzer and others have discovered. Instead they have refocused to trying to find the *mechanism* responsible for the preservation of these soft tissues over hundreds of millions of years. I do not believe that at any point the scientific community would be willing to reconsider the *date* placed on the fossils; instead statements like the below are made about Dr. Schweitzer's discoveries: "Chemicals [referencing organic molecules like collagen] that might degrade in a laboratory over a short period need not do so in a protected natural chemical environment...it's time to readjust our thinking." Kevin Padian, Curator of Paleontology, University of California Museum of Paleontology (Pearlman, 2007). As you can see, scientists in the paleontological field seem more willing to dismiss a mountain of data about the fragility of organic molecules, and essentially the entirety of all microbiological knowledge about their ability to consume organic materials, rather than question the ages placed on dinosaur bones.

Instead of considering that the bones might not be tens of millions of years old, the question at hand now for the paleontological community is the *way* old proteins could have stayed around for millions and millions of years. Multiple hypotheses for the preservation of organic molecules have generally centered on the proteins becoming paired with an *inorganic* mineral, which then is hypothesized to preserve the protein. This includes biomineral adhesion, clay mineral adsorption, iron preservation, and a most recently the heating of fossils that would create a modified or "roasted" crosslinking of proteins creating a polymer that shields from water, and is proposed to further shield proteins within from degradation. Most of these hypotheses have been disproven with subsequent years of research (for review see Thomas 2019). There has not yet been an explanation for how organic material could have survived in tact for a minimum of 66 million years.

The presence of original soft tissues in bones purported to be up to 130 million years old is not possible with what is known about decomposition and spontaneous degradation of organic molecules. Therefore one of the original presuppositions must be in error, either there really is not original tissue present, or the bones are not millions of years old. There is abundant *evidence* that there is original soft tissues present in these bones. There is abundant *belief* that the bones are millions and millions of years old.

Provide practical strategies, applications and solutions regarding your topic that can be used by teachers, chaplains and pastors in the South Pacific.

Practical strategies for dealing with long ages.

First, God displays compassion, empathy, organization, and He *is* truth. The way I have approached this topic in an ongoing way with my own 18 and 16 year old children, as well as the college and graduate students that I have worked with over the past 19 years as a professor, is to first recognize that all scientists, most likely, are *earnestly seeking truth*. No scientist wants to work under the ideology that they are trying to prove a point, whether the point is right or wrong. So at a fundamental level, almost unilaterally, every scientist really wants to know what is actually true and real in the world. So scientists that believe in evolution should be given the *curtesy of respect*; in some small but backwards way, they have already made a commitment to Christ, as they are already committed to believing truth! ① So let's begin by communicating to our youth that we respect the diligence and committedness of our fellow scientists to the finding of, and comprehension of, truth. ② I point out to young scientists that evolutionary scientists are viewing the world through the lens that there has never been, and could never possibly be, anything 'supernatural' in our universe; while Christians allow for that possibility. The Christian perspective is actually a more open minded perspective, and allows for more degrees of freedom in thinking; opportunistically, the most "open minded" perspective seems to be the highest level of what is acceptable in the culture of young people today.

When you start with this shared commitment of seeking truth, it is then a little easier to point out the parts of evolution that are based on mere theory, but which have no "truth," or experimentation, to back them up. ③ I point out to young scientists that much of what is said in text books regarding evolution are still hypotheses with no evidence to back them up, despite years of directed research to accomplish just that (the term "just so story" has been used to describe these types of theories). The hypotheses about evolution are only of what *could have been* (though often, there is blatant violation of the laws of thermodynamics in the stated ideology), but has never been shown to happen. While simultaneously, and honestly, I point out that creationists have never seen God speak the world into existence either. Neither have we seen a dead person brought back to life, or a blind man's eyes healed so he can see. But there *were* people who saw these things, and they testified that they had seen them. They believed that the person who did them was God, because that person *told* them He was God. Those people wrote down a record of what they had seen and heard so that generations after them might also believe, even though they had not seen. Nearly every one of these testifiers was tortured to death because they would not recant that they seen, and believed, these things. These are the same things a scientist does – I see my results, I believe they support my hypothesis, and I testify, and I publish a written record of what I have seen. Let me tell you, if someone threatened to torture ME to death unless I stated that I didn't actually believe my own research – absolutely, I would recant. This is because my own research has a low level of 'confidence.' This is to say, that right now I cannot possibly have all the information; I cannot see the proteins I study, I can only infer what they are doing from secondary effects of those protein's physical actions. I would never give my life in exchange for the interpretations I have made in the laboratory of what I have seen, believed, and written – I just do not have that level of confidence in molecular biology (because of experience where molecular biologists repeatedly through the years have discover that what they *thought* was happening was only a

very small piece of the actual process!) But the people who had seen Jesus and what He did – their confidence level in that experience was a 100% absolute, life-and-death, level of confidence. ④ I think it is really important to point out to young people that the bible writers were real people, with real lives, with real families, real plans for the future, but their confidence level in Jesus was so high that they would rather die than say they did not believe what they had seen, heard, or experienced. This fact is very different than any scientist would testify to about their own results.

One of the basic tenets of evolutionary theory is the long ages given by radiometric dating. The reality is that there are multiple lines of evidence that contradict the ages given by radiometric dating. ⑤ Soft tissues found in dead animals that are supposedly up to hundreds of millions of years old is one very strong argument that the age of life on this earth (and those dead animals) is not correctly predicted by radiometric dating. ⑥ This coupled together with other lines of evidence (Geology: erosion rates, lack of bioturbation, nonconformities in the geologic column, as well as abundant biological evidences: genetic entropy, biological information, epigenetics, etc.,) strongly indicate that life on this planet is not millions of years old, despite the results of radiometric dating – a method which makes a lot of assumptions (though those assumptions are always fully disclosed to anyone who is doing or studying radiometric dating).

⑦ I will also point out what I believe are the *numerous* examples of supernatural reality in the physical, spiritual, and emotional realities shared by all humanity and which are inexplicable by evolution. Some of these things are testimonies from my own personal life - Yes! Miracles have happened to me! And I have a testimony of conversion, and a peace and happiness that is evident in my life. Supernatural realities: Physical: all biological information needed to build a human starts off in a physical space no bigger than the period at the end of this sentence. Amazing universal constants that make perfect life possible. The fact that bacteria are the most evolutionarily successful organisms on our planet – why would they EVER have evolved away to something different? What natural selection could ever out-do a bacteria? Spiritual: God is testable in tithing. When I follow the principles of relationship with Christ as outlined in the bible, I begin to experience the gifts of the Holy Spirit – this is repeatably testable! Love, joy, peace, patience, gentleness, goodness, faith, meekness, and self-control all begin to become mine when I fix my eyes on Jesus and practice loving Him and others. Emotional: the realities of 'love' and 'joy' whose existence is unneeded and *unpredicted* in a strictly evolutionary worldview. The above are only a few of the supernatural realities I perceive in the world around me that support the realities of what is written in the Bible.

I conclude by saying that a loving *Christian* is the best testimony in favor of our loving, Creator God. So let your love abound more and more to those struggling in faith, especially those whose faith is being tested by the claims and interpretations of modern science.

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Compendium of Original Soft Tissues in ancient fossils

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