

CBS Annual Conference Abstracts 2019

Special Creation: Introducing *Tempus Elapso*

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How should Christian laypeople and educators *scientifically* understand the processes at work during the *supernatural* formation of the Earth? Is this even possible? Questions such as these become even more complex for scientists. How, for example, should the Christian geophysicist approach his discipline when he believes that the Earth's fundamental internal systems were created supernaturally?

One of the issues associated with this problem is a misunderstanding of the term *ex nihilo* (Latin for "out of nothing"). Unfortunately, most Christians interpret *ex nihilo* in a simplistic way that does not account for *process*. Process, however, is incredibly important for a *scientifically* accurate account of origins. That geophysical processes were indeed integral to Creation Week is discussed by John Baumgardner (2000, p. 50):

How did this prominent aspect of earth's structure [core, mantle and crust] come about? Did God simply speak it and it instantly appeared that way, or did He speak and a process unfolded, albeit rapidly, that yielded this result? The chemical makeup of the earth's rocks seems to be telling a story that God used a process.

Baumgardner suggested that the differentiation of our planet into core, mantle, and crust must have 'evolved' in some kind of progressive fashion, albeit rapidly (cf. Faulkner 2016).

I suggest a slight modification to Baumgardner and Faulkner's ideas. It's not just about process, or even accelerated processes. I propose that the differentiation of our planet occurred using a sequence of events that mirrored the *same naturalistic* processes operating today. All the processes that presently operate to *sustain* the Earth were working at the same rates, *relative to each other*, to build it in the first place. For example, fractionation and partial melting, two separate processes that currently produce felsic continental crust at exceedingly slow rates, worked together to form the crust during Creation Week at highly accelerated rates. Importantly, the two rates were kept in sync *with each other*, and by extension *with all other geophysical processes* working to differentiate the Earth. This would essentially be like watching a time-lapse (Latin: *tempus elapso*) video. This would mean that the only difference between a secular interpretation for the origin of the Earth's crust and a creationist one is the *time* involved. Our Christian geophysicist knows *exactly* how much time passed during the formation of the crust because he was *told*. It occurred within six literal days. This temporal distinction, however, can

only be seen with the eyes of *faith* (Hebrews 11:3). Importantly, *tempus elapso* creation must be restricted to the Creation Week. Scripture is very clear that 'death' was not incorporated into the "very good" creation, a mistake made by Phillip Gosse (1857) in *Omphalos*.

Both process *and* time-lapsing are necessary for the geophysicist seeking to *do* science. Since God anticipated *present* natural processes when constructing the Earth, our Christian geophysicist can rely on them when interpreting relationships that exist within Creation Week rocks. Earth was not designed to function *supernaturally*, it was designed to function *naturally* so that it can be understood. This would mean that anomalous geological features inconsistent with the *time* it takes to produce a mature planet *naturally* should not be found in Creation Week rocks. This is because *all* rates everywhere were accelerated. Geological features found within Creation Week rocks that 'prove' the Earth is about 10,000 years old must, therefore, be treated with extreme caution by young earth creationist apologists.

In conclusion, I propose that creationists start thinking in terms of an initial *ex nihilo* creation, followed by a *tempus elapso* transformation of that creation. This would provide Christians who are also scientists a solid framework in which to *do* science. To be consistent, however, I also propose caution when using anomalous geological features constructed during Creation Week to 'prove' that the Earth is less than 10,000 years old.

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Faulkner, D.R. 2016. *The Created Cosmos: What the Bible Teaches About Astronomy*. New Leaf Publishing Group.

Gosse, P.H., 1857, *Omphalos: An Attempt to Untie the Geological Knot*: John Van Voorst; Paternoster Row, London.

Baraminological Analysis of Fossil and Extant Eusuchia

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Eusuchia is a group of crocodylomorphs that includes modern crocodiles, alligators, caimans, and gharials, as well as the extinct family Planocraniidae, formerly known as Pristichampsidae (Brochu 2003, 2013). All known eusuchians are semi-aquatic predators except for the Planocraniidae which were terrestrial carnivores with laterally compressed skulls and hoof-like unguis (Brochu 2013). The eusuchian fossil record extends from the Upper Cretaceous to the present (Brochu 2003).

Hennigan (2014) suggested that there were three kinds of crocodylians on the ark, but he limited his analysis to extant crocodylians. In order to understand baraminological relationships of both extant and fossil eusuchians, we used BDISTMDS (Wood 2008) to analyze a morphological character matrix from Brochu (2011) with baraminic distance correlation (BDC) and multidimensional scaling (MDS). All 85 taxa from the dataset were analyzed with 80 out of 182 characters included. The bootstrapped BDC results show four blocks of significant positive correlation, although the two larger blocks (roughly corresponding to Alligatoroidea and Crocodyloidea) share considerable positive correlation between them. The Gavialoidea block does share positive correlation with the Crocodyloidea block and the non-crocodylian Eusuchia block (although with low bootstrap values), but it is negatively correlated with the Alligatoroidea block. The non-crocodylian Eusuchia block shares the least amount of positive correlation with the other blocks, with only a few pairings having high bootstrap values. The 3D MDS results show three main clusters (non-crocodylian Eusuchia, Gavialoidea, and Alligatoroidea + Crocodyloidea) with the non-crocodylian eusuchians spaced the farthest away from the rest of the taxa, although there is also a noticeable, smaller gap separating Gavialoidea from the Alligatoroidea + Crocodyloidea cluster. The Alligatoroidea + Crocodyloidea cluster is U-shaped with the fossil taxa in the middle connecting the extant taxa at the ends.

Based on our baraminological analysis, we think there is strong evidence for continuity between Crocodyloidea and Alligatoroidea, and weaker evidence for Gavialoidea also being continuous with this group. Thus, we suggest that, at minimum, Brevirostres (Crocodyloidea + Alligatoroidea) and associated taxa (Planocraniidae and *Borealosuchus*) are a holobaramin, and that the holobaramin likely also includes Gavialoidea. There does appear to be weak evidence of discontinuity separating Crocodylia from the non-crocodylian eusuchians. These results are surprising because both alligatoroids and crocodyloids are found in Mesozoic strata. If our interpretation of the baraminological results is correct, then more than one species from this holobaramin survived the Flood (assuming a K-Pg Flood/Post-Flood boundary). One possibility is that crocodylians survived the Flood outside the Ark as aquatic animals, which might explain why some eusuchian taxa are found on both sides of the K-Pg boundary in the same geographic location (e.g., *Borealosuchus*). Modern crocodylians have been observed living in saline environments for extended amounts of time and have even been observed having barnacles growing on them (Grigg & Kirshner 2015). Alternatively, two representatives from the crocodylian holobaramin could have been on the ark. If this is the case, then it may be that ark kinds are not necessarily equivalent with holobaramins.

One interesting result of our baraminological analysis concerns the importance of fossil taxa to understanding created kinds. When the baraminological analysis for Eusuchia was run using only extant taxa, the results appeared to show discontinuity separating Alligatoroidea, Crocodyloidea, and Gavialoidea. The fossil taxa filled the gaps in morphological space between these three groups. Thus, we recommend caution in assuming discontinuity and created kinds in analyses lacking fossil taxa.

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Continuous Environmental Tracking: A Creationist Explanation for Biological Anticipatory Systems

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Continuous Environmental Tracking (CET) is an engineering-like, organism-focused model which informs a creation model of biological adaptation (Guliuzza 2018). The primary assumption of CET is that engineering principles underlying human-engineered tracking systems like cruise control can also be found as part of the behavior, genetics and physiological function of biological organisms. This design inference is consistent with the fact that a Creator has hard-wired His creation to contain intrinsic systems which can purposefully track environmental changes to deploy appropriate adaptable responses.

Because CET expects creatures to continuously track changing conditions using intrinsic detection systems, we predicted in previous publications that some biological adaptations should be characterized as not purely reactive, but proactive (Guliuzza and Gaskill, 2018) casting doubt on evolutionary explanations for the appearance of innovative biological systems. In this study we provide evidence which supports our predictions by showing that logic-based systems give organisms foresight—both conscious and unconscious—regarding how they preemptively self-adjust to handle predicted future conditions. We also demonstrate for the first time how biblical principles support our model of *de novo* designed tracking systems in living organisms.

For example, tomato plants detect snail mucus in close proximity and determine that there is an imminent attack. They “integrate the many sources of information regarding attack in their environment to optimize investment in defense...[to] prioritize risk information...whereby information that is likely linked with greater imminent risk triggers a stronger defense” (Orrock 2018).

In another example researchers noted that honeybees exposed to starvation during development are more resilient to starvation as adults and concluded that, “most organisms are constantly faced with environmental changes and stressors. In diverse organisms, there is an anticipatory mechanism during development that can program adult phenotypes. The adult phenotype would be adapted to the predicted environment that occurred during organism maturation” (Wang 2016). This observation is consistent with our model. Furthermore, innate capability enables social insects like honeybees with no centralized control to track changes as a unit as consistent with the biblical idea that they function “without a leader” as described in Proverbs 37:21. Another study involving *C. elegans* uncovered “...a genetic network that mediates effects of a mother’s diet on the size and starvation resistance of her offspring” (Hibshman 2016). In addition, researchers studying sea urchins

had similar findings and concluded “...that transgenerational plasticity in situ could act as an important mechanism by which populations might keep pace with [i.e., track] rapid environmental change” (Wong 2018).

Additional studies on behavioral flexibility conferred by “foresight” derived from anticipatory systems said “...[arthropods] seem to use internal models of the surrounding world to tailor their actions adaptively to predict the imminent future” but candidly add “we currently have no information about the circuitry that underpins the imagination of possible future states or problem solutions...” (Perry 2019).

We believe a creationist framework like CET contributes to our understanding of the circuitry and mechanisms which underpin organismal tracking of the environment. We also anticipate elegant engineering within creatures that, like their external beauty, greatly exceeds human capability (Luke 12:27).

Since all creatures must face uncertain future environments, then anticipatory mechanisms producing foresight and guiding responses would be a vital design feature. Creatures exercising foresight is yet another way they reflect a superb characteristic of their Creator God.

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An Example of Man’s *Imago Dei* Mission Being Supported by Molecular Biology: The Importance of Understanding the Image of God in Biology

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This paper discusses how man’s calling and mission, related to being made in the image of God (*Imago Dei*), is supported by features in our molecular biology design. The intent of the paper is apologetic, showing how our biology supports truth in Scripture, I show the importance of how our understanding of biology may inform our understanding of the image of God by showing one example, illustrating where spiritual and biological components work together in redemption for an individual to overcome alcohol abuse and be restored to vitality in one’s *Imago Dei* mission.

The image of God (Gen 1:26) provides sanctity for man’s life and also can be postulated to be related to our mission on earth. For instance our mission includes us acting in three roles, (1) as a king, where we are to rule creation, (2) as a prophet, where we

are given the authority to redeem our cultures and communities, and (3) as a priest, where we bring the presence of God to the ends of the earth. As told to us in the Old Testament and characterized by Ancient Near East cultures we can see a scriptural parallel to the image concept in Genesis 1-2 because we bear the image of our King as His emissaries wherever we go, bringing the King’s voice so all may hear. Man is given the call to rule over creation (Gen 1:28 *subdue*) and the mission to bring the presence of God to the ends of the earth (Gen 1:28 *fill*). Plus, we are fashioned for missional action, such as created for good works in Christ (Eph 2:10) and commanded to go, make, and teach disciples in all nations (Matt 28:19-20). We can see the special place we are given in creation (Gen 1:26-28, Ps 8, 1 Cor 15:24-28).

Wise (2018) discusses how priest, king, image, and service relate to biology. In addition to this important discussion, these elements relate to one another in our *Imago Dei* mission, including mechanisms for redemption and recovery that help us fulfill our mission in a fallen state. In order to show an example how our biology is linked to our *Imago Dei* calling and redemption, the case study of alcohol metabolism, abuse, and recovery is examined. Nutrient metabolism is part of what our bodies do to empower us to be energized to do our mission. Ethanol metabolism uses aspects of nutrient metabolism features, and is specifically composed of two major steps of breaking down ethanol (CH₃CH₂OH) down first into acetaldehyde (CH₃CHO) by the alcohol dehydrogenase (ADH) enzyme, and then further breaking acetaldehyde down into acetic acid (CH₃COOH) with the enzyme aldehyde dehydrogenase (ALDH). An instance will be examined where ADH can experience epigenetic modulation and change ethanol metabolism for an individual. ADH has locations where DNA methylation can take place (called CpG sites), along with alleles where additional CpG sites are created in a specific individual’s DNA. This behavior will be illustrated by looking at the ADH single nucleotide polymorphism (SNP) of RS1229984 with UK Biobank data for specific test cases. The ability of the human body to handle toxins like alcohol shows an example of where and how biology may indeed participate in recovery consistent with God’s desire for humans to be healed and redeemed. Also, because this physiological system is sensitive to epigenetic change this is also consistent with a biology which is designed for repair and perhaps repair which is influenced by human behavior and lifestyle. This aligns with the supportive spiritual environment that must exist for spiritual change to take place in recovery.

Although in different domains, biological and spiritual components cooperate in aligning us towards God in complimentary ways, showing God’s redemptive design features ministering to us when we fail. Epigenetic adaptation shows an example of how our molecular biology participates in redemption and recovery.

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Preliminary Results from Reanalyzing the Cynodont to Mammal Transitional Sequence

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Cynodonts are conventionally recognized as transitional between “reptiles” and mammals because of their stratomorphic acquisition of mammalian characteristics in the skull, postcranial

skeleton, and the mandibles (Ruta et al. 2013). In the conventional model, cynodonts record the transition between the reptilian jaw joint (quadrate-articular) and the mammalian jaw joint (squamosal-dentary), as well as the beginnings of the mammalian ear bones. Baraminological analysis has revealed significant evidence of discontinuity within non-mammalian Cynodontia (Talavera and McLain 2017) with Tritylodontidae and *Therioherpeton* + Trithelodontidae + Brasilodontidae + Morganucodonta (TBTM) as holobaramins and the rest of the non-mammalian cynodonts as an apobaramin or possible holobaramin.

In order to understand these cynodonts and the purported jaw-joint transition from a creationist perspective, we determined to take a big-data approach by analyzing and comparing cynodont phylogeny, taxonomy, stratigraphy, biogeography, and paleoecology. We retrieved a morphological dataset from Ruta et al. (2013) and ran subsets of the characters through the phylogenetics software PAUP (v. 4.0) to see which characters were influencing the phylogeny the most. We also obtained a dataset from the Paleobiology Database (PBDB) to observe cynodonts through the stratigraphic record worldwide. Finally, we retrieved data from Lautenschlager et al. (2018) on the miniaturization of the jaw across the cynodont-mammal transition and compared it to diets (Abdala and Ribeiro 2010) and stratigraphy.

For our cladistic analysis, we divided a dataset from Ruta et al. (2013) into three character subsets: mandibular, postcranial, and dental, and ran each in PAUP. We then compared these trees with the published phylogeny from Ruta et al. (2013) and the Talavera and McLain (2017) baraminology results. The mandibular and postcranial subsets were the closest match for the published phylogeny, whereas the results from the dental subset recovered Tritylodontidae within Cynognathia and several “basal” cynodonts within Probainognathia. The closest match to the baraminology results was the mandibular cladogram, which separated Tritylodontidae from the TBTM group, whereas the postcranial cladogram recovered *Brasilodon* and *Morganucodon* within Tritylodontidae.

We added to the PBDB data the family-level ranks for each cynodont taxon listed. Stratigraphic occurrences for the cynodont taxa were recorded at the stage level from the Roadian to the Cenomanian. The database included fossil occurrences for 23 countries and Antarctica, which we divided into eight geographic regions. We graphed the stratigraphic stages with the number of family occurrences. Europe and South Africa exhibited the greatest stratigraphic range, whereas South Africa and South America were the most diverse each having 11 families. Cynodont occurrences in Gondwana were most numerous in the Upper Permian-Upper Triassic (mainly “basal” Cynodontia, Cynognathia, “basal” Probainognathia, and Trithelodontidae), whereas Laurasia mainly included Upper Triassic-Lower Cretaceous occurrences (mainly Tritylodontidae and Mammaliaformes).

When we compared cynodont jaw sizes and diet to stratigraphy, we found: 1) Permian-Lower Jurassic – mainly small insectivores/carnivores; 2) Middle-Upper Triassic – both large and small with herbivores, carnivores, and insectivores; 3) Uppermost Triassic-Lower Jurassic – mainly small insectivores and medium to large herbivores. Middle Triassic herbivorous cynodonts (Gomphodontia) are not the same as the herbivores in the uppermost Triassic-Lower Jurassic (Tritylodontidae).

We have not yet developed models to explain the cynodont

fossil record from a young-earth perspective, but it appears that more mammal-like cynodonts appear higher stratigraphically than more “basal” cynodonts. We propose that creationist research on cynodonts focus on niche partitioning and competitive exclusion in the pre-Flood world, which may help explain cynodont stratigraphic and biogeographic patterns.

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Cynodont data downloaded from the Paleobiology Database on February 1, 2018.

Baraminological Analysis of Choristodera

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Choristoderes are an extinct group of aquatic diapsid reptiles of uncertain affinities. Most choristoderes were small creatures, resembling crocodiles in general shape, but without any body armor. Additionally, choristoderes had anteriorly-positioned nostrils at the very tip of their snouts, in contrast to crocodylians which have dorsally-facing nostrils. The choristodere fossil record extends from the Middle Jurassic to the Miocene, which means that, unlike most extinct Mesozoic reptile groups, choristoderes were able to reestablish their populations after the Flood (assuming a K-Pg Flood boundary).

In order to understand choristodere baraminological relationships, a morphological dataset (Matsumoto et al. 2013) was analyzed with BDISTMDS (Wood 2008) and with Principal Components Analysis (PCA, following Doran et al. 2018). The dataset contained 27 taxa (8 outgroup and 19 ingroup) and 116 characters, and 25 taxa and 42 characters were retained for statistical baraminological analysis at a character relevance cutoff of 0.75 and taxic relevance cutoff of 0.31 (two taxa were very poorly known).

The baraminic distance correlation (BDC) results revealed three blocks of positive correlation: 1) outgroup taxa, 2) Neochoristodera, and 3) other choristoderes. The outgroup block shares significant negative correlation with the neochoristoderes and *Hyphalosaurus* sp. in the other choristodere block. For the most part, negative correlation is not present separating the two choristodere blocks. However, *Cteniogenys* and *Hyphalosaurus* sp. unite the two blocks with positive correlation for several pairings. The 3D multidimensional scaling (MDS) results show four clusters of taxa: 1) sauropterygian outgroup taxa, 2) other outgroup taxa, 3) Neochoristodera, and 4) other choristoderes. There is an obvious gulf between the outgroup clusters and the choristodere clusters, with smaller gaps separating the respective clusters on each side of the gulf. *Cteniogenys* is the closest of the non-neochoristodere choristoderes to the Neochoristodera cluster. For the PCA results, 72.1% of the variance was explained through 3 components (PC1: 36.9%, PC2: 20.3%,

PC3: 14.9%). Together, PC1 and PC3 clearly separated a tight cluster of choristoderes (except *Khurendukhosaurus*) from the outgroup taxa. However, comparing PC1 and PC2 revealed two linear trajectories (neochoristoderes and the other choristoderes, respectively), with the sauropterygian outgroup taxa mixed in with the non-neochoristoderan choristoderes.

We interpret the negative correlation (BDC) and separation (MDS and PCA) between the outgroup and choristoderes as evidence for discontinuity surrounding Choristodera, making Choristodera an apobaramin. We interpret the two blocks of positive correlation, two clusters in MDS, and two linear series in PC1/PC2 as evidence for two choristoderan monobaramins. It is unclear whether these two monobaramins are continuous with each other. The PC1/PC3 and BDC results suggest they share continuity. In contrast, the MDS results and two linear trajectories in PC1/PC2 seem to suggest separation.

Both neochoristoderans and non-neochoristoderan choristoderans are found in Mesozoic and Cenozoic deposits, with the neochoristoderan genus *Champsosaurus* (Upper Cretaceous – middle Eocene) found on both sides of the K-Pg boundary. If there are two holobaramins, then the presence of Mesozoic and Cenozoic representatives of both groups suggests that both groups survived the Flood and reestablished for a time in the post-Flood world. If Choristodera turns out to be a holobaramin, then it could be hypothesized that *Champsosaurus* was brought on the ark and diversified in the Cenozoic. In that case, the non-neochoristoderan Cenozoic genus *Lazarussuchus* would actually be a descendant of *Champsosaurus*. A third scenario is that choristoderes survived the Flood outside the Ark, since they were aquatic creatures. Regardless of which, if any, scenario is correct, it is unexpected that *Champsosaurus* returned to western North America where other members of its genus were buried by the Flood. Further study of the deposits immediately above and below the K-Pg boundary is needed to understand the relationship between choristoderan fossils and the Flood.

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Psalm 104 and Animal Death Before the Fall

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Evolutionary and old-earth creationists commonly use Psalm 104 as a proof-text that animal death is a normal aspect of God's good creation (see, e.g., Collins 2005; Poythress 2006; Bishop et al. 2018; Keathley 2019). Ken Keathley states, "Psalm 104 provides a poetic commentary on the creation account of Genesis 1. It presents lions acting as predators and receiving their prey as food from God. This fits well with the OEC contention that human death alone resulted from Adam's rebellion." Bolstering this view is the noted correspondence between the psalm's structure and the basic order of the days of creation in Genesis 1:1-2:3 (Kidner 1975). While such a structure may exist, this paper argues that the

psalmist's meditation on creation is grounded in his experience of fallen creation, incorporating praise for both God's initial acts of creation and especially his sustaining of post-Fall creation. It is through faithfully sustaining fallen creation that God will accomplish his purposes.

Accepting fallen creation as the primary reference point of Psalm 104 is not dependent on acknowledging a particular structure for the psalm. William Barrick rejects the days-of-creation structure of Psalm 104 and interprets vv.6-9 as a reference to the flood waters of Genesis 7. Some key aspects of his exegetical analysis are that "above the mountains" in v.6 parallels Genesis 7:20, "rebuke" in v.7 is a strongly negative term not fitting for initial creation, and that "boundary" is strategically emphasized in v.9, calling to mind God's promise that the waters will not again cover the earth (Barrick 2018). Richard Davidson, on the other hand, accepts the days-of-creation structure and argues that vv.6-9 primarily refer to the third day of creation, but concedes that in v.9 there may also be an allusion to the Genesis flood (Davidson 2015). Barrick and Davidson agree, however, that the psalmist incorporates elements of both initial and post-Fall, post-Flood creation in his meditation. Evidence of a post-Fall, post-Flood context for Psalm 104 identified by Davidson includes rain water (v.13); references to bread and wine (vv.14,15; first mentioned in Genesis immediately after the Fall and the Flood, respectively); a separation of the active time of man and beast (vv.20-23; perhaps indicative of animals' fear of man); and humanity's intensified exertion in labor for food (vv.22,23).

Most importantly, dismay and death are active in the world for all God's creatures, including man (v.29). Sin and wickedness are also present (v.35). That the psalmist's reflections incorporate elements of fallen creation is not surprising; such experiences comprised his continual interactions with creation. The sinner is as much a marvel of God's creation as are the young lions roaring for their prey, but it cannot be deduced from Psalm 104 that either was found in such a condition prior to the Fall. The psalmist praises God for the way he faithfully sustains creation's current state but acknowledges the imperfection of that state: sin and wickedness must be eradicated. The earth and its inhabitants await God's judgment and his justice. The psalm concludes leaving unresolved how God's justice will prevail without the annihilation of creation but expresses faith in God leading to praise that he will accomplish his purposes.

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Genesis 1:1 According to the Masoretic Text

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In Hebrew, Genesis 1:1 hosts several points of contention impacting its proper translation and interpretation. Some interpreters defend the traditional translation, “In the beginning, God created the heavens and the earth,” while others challenge it. Both proponents and opponents appeal to lexical, morphological, grammatical, and syntactical features in the text as support. The first word, *b’reshith*, is a noun with a prefixed preposition. The second word, *bara*, is a third person masculine singular verb. Disputants contest the definiteness of *reshith* (“beginning”), whether it is in an absolute state (“the beginning”) or in a state of construction with what follows (“the beginning of”), and whether *bara* (“created”) indicates a completed past tense action or has the force of an infinitive. Hence, translators have rendered the passage in various ways (“In the beginning, God created...”; “In the beginning of God’s creation...”; “When God began to create...”). One’s understanding of 1:1 in relation to the following verses impacts one’s view of what God actually did as the first creative act, whether there was already matter in existence when God created, and whether the text teaches that God created the heavens and the earth on or before day one.

The Jewish scribes known as the Masoretes provide exegetical help for interpreters. The Tiberian system, used in the standard Masoretic Text of the Old Testament (MT), meticulously preserved an ancient tradition with vowels, accents, and divisions of the text. Hebrew students learn the vowel points to properly pronounce and parse the text. The accents historically directed changing, punctuation, and accent. Fuller and Choi (2017) note that their Hebrew name *te’amim* “means ‘understanding, sense,’ indicating that the understanding or sense of the syntax is communicated through the accents.” The accents show relationships of words and phrases within a verse via disjunctive accents and conjunctive accents of varying relationships and strengths. The Masoretes also divided the text into sections, including paragraphs, a custom at least as ancient as the Dead Sea Scrolls.

Despite the intricacy and antiquity of the features of the MT, some scholars dismiss or ignore them (Lode 1994). However, others have paid attention to their exegetical relevance. For Genesis 1:1, they provide at least four clues.

First, while the vowel pointing alone does not clarify the definiteness and state of *reshith*, it clearly presents *bara* as a finite, third person masculine perfect verb (“created”), not an infinitive (“to create”). Second, the disjunctive *tiphcha* accent on *b’reshith* suggests an absolute state by its slight isolation from *bara Elohim*: “In the beginning” / “God created” (Moskala 2011). Third, the disjunctive *silluq* and *soph pasuq* on *ha-aretz* (“the earth”) make the strongest break, occurring at the end of the verse. Finally, the Leningrad Codex and the Dead Sea Scrolls display the first seven paragraph divisions of Genesis in direct correspondence with the days of creation (1:5, 8, 13, 19, 23, 31; 2:3), strongly suggesting that Genesis 1:1-5 is a unit containing nothing other than the events of day one (Lyon 2019). Thus, the MT supports the translation:

1 In the beginning / God created the heavens and the earth.

2 Now the earth was empty and uninhabited...

3 And God said, Let there be light...

4 And God saw...God separated...

5 And God called... And it was evening and it was morning, day one.

The ancient Masoretic tradition of interpretation deserves serious consideration and engagement when seeking to understand the Bible’s first verse. Vowels, accents, and paragraphs suggest that the Masoretes viewed Genesis 1:1 as an independent clause describing an absolute beginning and the first event of day one.

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Biblical Death as Cessation of Function

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Our present (intuitive) understanding of [biological] life is comfortable with assigning as ‘living’ everything that the Bible labels as living. However, the absence of any biblical reference to plants being alive, combined with the contrast between plants and living things in Gen. 1:30 and 6:19-21, suggest plants are not biblically alive. Thus, our present view of life is not biblical. Furthermore, if plants are not alive, then (*e.g.*) plants being ‘twice dead’ (Jude 12) suggests our typical definitions of death (*e.g.*, cessation of life, or separation) do not apply to all biblical references to death.

Since scriptural concepts (*e.g.*, love, knowledge, truth) tend to be more holistic than the corresponding human concepts, and Scripture is a message from a unified God, I suggest there is value in striving for a single perspective on death that fits with as much biblical data as possible. I suggest defining biblical death as cessation of function moves us towards a more satisfactory understanding of death. For example, if we define human function as per Gentry’s (2012) exegesis of Gen. 1:26-28, humans have a (spiritual) function of intimate relationship with God and a (physical) function of rulership over the creation. Humanity’s spiritual function is supported by the entire creation’s illustration of God’s nature (Rom. 1:18-20). Humanity’s physical function is supported by (a) the entire creation in its anthropic principle traits, (b) plants in their provision of food (Gen. 1:29-30; 6:19-21), and (c) biotrix organisms (fungi, algae, protozoa, bacteria) in their support of all biological life. The fact that most Hebrew and Greek words for ‘plant’ are derived from ‘green’ reinforces that the primary (physical) function of plants is the provision of food. ‘Living creatures’ seem to fulfill an additional physical-world function of ‘life’—some sort of state of being that has intrinsic value beyond mere existence and/or fulfilling of support functions.

If biblical death is defined as cessation of function, ‘dying’ is irreversible diminution of function. These definitions, in turn, make sense of much scriptural data: (1) Adam died when he

disobeyed (Gen. 2:17) and (2) our comprehension of sin brings death (Rom. 7:9)—even when the person is still alive—in the sense that the relationship-with-God function ceases; (3) unbelievers are dead (*e.g.*, Eph. 2:1)—even when physically alive—in the sense that the human relationship-with-God function is not operating; (4) cessation of human physical life is death—even when the person lives on (*e.g.*, Luke 16:22-23)—in the sense that the human rulership function ceases; (5) believers do not perish at their physical death (*e.g.*, John 3:16) in the sense that their human relationship-with-God function never ends; (6) unbelievers ‘utterly perish’ (II Pet. 2:12) and (7) unbelievers experience a second death (Rev. 2:11; 20:6, 14; 21:8) in the sense that hell permits no hope of ever fulfilling the human relationship-with-God function; (8) cessation of physical life in animals is death because their function of living ceases; (9) a grape vine can re-sprout after dying (Job 14:8-9) if its death involved just the cessation of its food-producing function; (10) a seed can grow into a plant only after it dies (John

12:24) because its food-producing function (to be eaten as a seed) must be forfeited for it to be planted; (11) a fruit tree whose fruit shrivels up, and then fails to bear fruit is ‘twice dead’ (Jude 12), even though the plant continues to live, in the sense that first its food-producing function failed in mid season, and then it ceased altogether; (12) the heavens and earth will perish (Psa. 102:25-26; Heb. 1:10-11) in the sense that they cease to function in the support of human life; (13) inanimate objects can perish—*e.g.*, land (Gen. 41:36), organs (Ex. 21:26; Mat. 5:29-30), bottles (Mat. 9:17; Luke 5:37), meat (John 6:27)—when they cease to fulfill their function; and (14) inanimate objects ‘wax old’—*e.g.*, clothing (Deu. 8:4; 29:5; Neh. 9:21), and heavens and earth (Psa. 102:25-26; Isa. 51:6; Heb. 1:10-11)—when their function is irreversibly diminished.

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