IS GENESIS HISTORY?

The Interviews

Marcus Ross, PhD – Paleontology
Discovery Park of America

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On February 8, 2016, Compass Cinema interviewed Dr. Marcus Ross (PhD in Environmental Science (Geoscience) from the University of Rhode Island) and Dr. Del Tackett at Discovery Park of America, Union City, Tennessee.

Natural History Museums-Two Paradigms

DEL: Marcus, these places are always fascinating to me. There's so many creatures that we don't see today.

MARCUS: I love coming to natural history museums. For me, as a paleontologist, it's like a chance to go to a zoo. It's all the animals that used to live before the Flood. The dinosaurs that are out over here—marine reptiles that are back over that way—it's all this stuff that used to be here that isn't; it's like a chance to step back in time.

DEL: It is like a zoo except they're not alive. They're all dead.

MARCUS: And they don't smell, so that's pretty good.

DEL: Well, Marcus, we have seen the Grand Canyon. We've looked at all of the layers and so forth. We've talked to Dr. Snelling about the radiometric dating issue and so forth. What I want to do if you can, can you kind of give us an overall picture of the fossils and how all this stuff fits together?

MARCUS: Yeah. It's one of those things where you can spend a lot of time in creation/evolution issues talking about particular topics, but some times you need to step back and take a look—okay, what's the overall course of history? You've got important benchmarks in Scripture that help to anchor us in time. From Creation week, through the effects of the Fall, to the events of the Flood, and into the post-Flood world. And so what we want to do, as we think about all these beautiful things that are around us here, is think where do they fit in all of that, and how is it that they relate to those particular events in space and in time? A natural history museum is a chance to see animals in three dimensions, but remember that there's the fourth dimension of time that is really helping to bring all this together. So when I'm thinking about these types of creatures, I'm thinking about a world that's right before the Flood. Now if the context of them is from the sedimentary rocks that you saw in the Grand Canyon—those rocks are made during Noah's Flood and they are killing and destroying animals during Noah's Flood. But the natural history museum is basically giving us a chance to see what it was like just before that happened. So we're somewhere stuck in between the events of Creation week, at the end of which God says everything is very good—then you have the Fall which introduces sin, death to the animal world and to humans. And then you have the Flood. And so this natural history museum, or any natural history museum that somebody might visit, is really giving us a snapshot of the stuff that was buried in Noah's Flood. It was a time—they were just kind of living their life until the Flood waters came and—as the Bible says—took them all away.

DEL: We've been talking about two paradigms that basically are different views of earth history. It's not a conflict between the Bible and science, but it's essentially a scientific perspective that takes two different views of the same data.

MARCUS: Yeah, that's exactly true. A lot of people will try and put this as a Bible versus science type of situation, but it is about trying to understand which of the two views of natural history explains the data the best. And when you come to a museum that has all this stuff— almost every museum in the country is going to be presenting one of those paradigms— naturalistic, a materialistic view of earth history where basically the laws of physics and chemistry are the only things we could ever use to explain the history of life over time. On the other hand, if we come into a museum like this and we are thinking in terms of Biblical history—if we're thinking in terms of a paradigm that's built off of Genesis—then we start to see these same exact data, these same fossils, these same rock strata, these same radioisotopic materials that you've taken a look at, and talked with people about. We can interpret them in a different way. It's not about Bible versus science. It's about two different modes of interpreting the same data. And once we recognize that then it's a question of which one can do it the best.

Marine Deposition of Fossils

DEL: As you have looked at these two paradigms and studied that data, what is it in that data that causes you to think that the Genesis paradigm has the right perspective?

MARCUS: Well, there's a couple of really big key areas. You take just kind of a helicopter view looking down—there's a few things that point to us very nicely. One is that all these fossils that are found throughout the world are in rock layers that were laid down mostly in marine conditions. There are some that might be grabbing from terrestrial environments and pulling them back in, but dominantly we've got marine organisms on the continents and that, in and of itself, is rather striking and surprising. You think, "Well, where are the marine organisms?" Well, they're in the ocean. But the sedimentary record of the marine world is actually fantastically good on the continent and there's a lot more marine rocks on the continents than there are terrestrial rocks. And thinking in terms of a paradigm rooted in Genesis, that makes perfect sense: the Flood waters rose and buried and covered the world, then whatever was in those oceans was drug up and placed onto the continents. So, I think that's just the first of one of the things that you makes you go, "Wow, that's really odd." That doesn't make a lot of sense from an old earth perspective or from a perspective that is rooted in just mechanistic physics and chemistry.

DEL: So you're saying that we have these marine fossils—these are fossils from creatures that were in the sea, the bottom of the sea, and so forth—all over, even on mountains.

MARCUS: Yeah. So the same rock units that you saw in the Grand Canyon that had those nautiloids. Those types of limestones are found across the entirety of North America. They're in my hometown of Lynchburg, Virginia and not far away—they're in places like Pennsylvania; you can trace them down to Georgia over into Tennessee. Everywhere you find these marine deposits. We've got dinosaurs behind us over here, but further back over in the museum they've got sections of marine vertebrates, things like mosasaurs which are big swimming reptiles. Mosasaurs are found in places like Kansas, South Dakota, Sweden, Antarctica, the Netherlands, Belgium, and Morocco. They're absolutely everywhere. They're globally distributed and they're distributed on continents, not in the marine record or at least the ocean record as the oceans exist today. So looking at these things, you're saying, "What is it that has the power, what is it that

has the capacity to take the marine world and throw it on top of the continents in such a violent and destructive manner?" And the Flood makes perfect sense for this.

DEL: So a non-catastrophic view, as the conventional paradigm would say, doesn't seem to match that kind of evidence.

MARCUS: Right. There are ways in which the older paradigm approaches this sort of thing and says, "Okay, the continents have to be lower down through plate tectonic activities." And so there are explanations. Again, both groups of these two paradigms are trying to explain these data and both have some pluses and minuses to them. The old earth perspective, the naturalistic paradigm, has got a lot of things going for it and has had a lot of paleontologists, geologists—smart people—looking at these things and trying to establish that story. So it's actually very robust. It's well laid out. But, on the other hand, there's a lot of this evidence for rapid, drastic, global catastrophe that makes a lot of sense from a global Flood perspective.

DEL: So we have a very large extent of these fossils. Are there a lot of them?

MARCUS: Untold billions. And think of when you were at the Grand Canyon and Dr. Austin was showing you those nautiloid beds. We have a tendency to think that fossils are just kind of sprinkled here and there all over the place. But fossils are only found in sedimentary rock so you've got to have the right types of rocks around. Not every place has got them. But nonetheless when you have sedimentary rocks, those fossils tend to be found in distinct layers where there are very, very large numbers that have been destroyed. So in the limestone or the sandstone, you might have a bunch that don't have fossils, but then there's a layer of catastrophe. There's a layer in which thousands and thousands of individuals have been buried and destroyed and their materials have been locked up in these rocks for us to later on discover. So the numbers are mind-boggling in terms of how much is out there. If we took the world and we ran the experiment of the Flood again—not that we want that to happen—what you would end up with is the same kind of pattern where you have sedimentary rocks and usually layers within those rocks that are going to have large numbers of fossils. It's the sort of thing that speaks to catastrophe, not the sort of thing where the fossil record is gradually accumulating bone by bone, shell by shell, little by little over untold eons of time.

DEL: So you don't see it as much as an evolutionary picture. You see it more as a catastrophic graveyard.

MARCUS: It is. And it's a graveyard on top of a graveyard on top of a graveyard where these pulses of water from the Flood are moving over the continents, grabbing ecosystems or dragging marine ones up from deeper in the ocean and pulling them onto land. And as one gets deposited and the waves come back, they start pulling and piling additional stuff on top of that. And so every time we see a layer of rock that's this thick, we're thinking about an event that probably took minutes to make—not thousands of years, minutes—for just this one package of rock. Sometimes even seconds. And we know that this can happen even in modern day environments where tsunamis and the like are able to do vast amounts of geological work in effectively a split second.

The Fossil Record & Animal Trackways

DEL: So these tsunami waves are building up all of these fossils. Is that what we call the fossil record?

MARCUS: Yeah. When a paleontologist talks about the fossil record, he's thinking vertically. He's thinking about different sorts of fossils that are in different layers of rock, and not necessarily something like, well, this one is in a sandstone, this one is in a limestone. They're thinking about what is the position of this fossil with respect to some other species in the fossil record, and thinking in a vertical column-sort of situation. We're also thinking a bit about what type of fossilization is going on, what's the nature and character of the unit? And so in some fossil areas you've got underwater creatures and all the shells are broken to pieces and they're all kind of ripped up together and put into this one, big mass. And other times you've got deposits where everybody seems to be perfectly preserved and really nice—like the Burgess Shale which has got lots of mud, very fine material—and all these creatures are just pristinely preserved so we can even see soft tissue, soft part anatomy, things like the feathery gills of a trilobite, or the soft tissues of a worm, or a mollusk of some kind.

DEL: What are some of the other data that you're seeing that convinces you of this paradigm?

MARCUS: One very curious situation with the fossil record — and thinking vertically about things — is not the hard parts of the animal but the trackways, the movements that they left behind. So in North America, for example, the first dinosaurs are in what are called Triassic sediments. These are units about halfway up in the fossil record and what I would consider to be about the midpoint of the Flood or so. But the first record of dinosaurs in North America are not the bones. They're footprints.

DEL: Oh really?

MARCUS: Now this is a pattern that's repeated in several different areas. Our very first amphibian fossils in the rock record a little bit lower down, are footprints, not hard parts. They're not skeletons. They're not jaws. They're not teeth. They're not bones. This is a pattern that we see in several different groups, trilobites included, where their footprints are first and their body parts are later.

DEL: Now when you say first, you're talking about in lower layers?

MARCUS: Right. A geologist always thinks from the bottom going up—or, at least a paleontologist does. So, if I'm thinking the lowest rocks, first those are the crystal rocks that you saw in the Grand Canyon, the Creation rocks, and then you've got the Great Unconformity where the earth is scoured, and then on top of that you've got all the layers of flat sedimentary rocks. So a geologist like me is thinking—okay, first appearance is the first time I see, from the bottom going up, a particular type of animal, plant or creature. For the trilobites, for the amphibians, for the dinosaurs, the first time I find evidence of them in the fossil record, it's from trackways, not hard parts, not the shells, not teeth, not the bones. From an old earth perspective that's really weird and hard to grapple with, because teeth and shells and bones fossilize really well. You have a lot

more of those in the fossil record than we have trackways, because trackways are made out of soft mud. They're easy to wipe out. You think about when you go to the beach you leave some trackways there; they're gone with the next wave. But when it comes to the fossil record from a global Flood perspective—starting in Genesis and recognizing that the Flood is a dynamic and destructive event—we have evidence of these animals running away from whatever is coming. To have that next wave of sediment bury their tracks and then bury them and, maybe, the wash back that's coming back from the shore area. And so the discovery of a pattern here—and this is important, it's not just an isolated fact—it's a pattern of trackways followed by bones and teeth and shells that says there's not much time between the formation of this trackway and the discovery of the trilobite or the dinosaur.

MARCUS: From an old earth perspective you've got to have maybe hundreds of thousands of years between the trackway production and ultimately the animal that made it. But that obviously doesn't make a whole lot of sense, because if there's trackways, there are animals, and those animals have bones and teeth and shells to them. Why aren't they fossilized? If you roll the dice, bones and teeth and shells are going to come up first almost every time. But here in the fossil record, it's like you've rolled snake eyes ten times in a row. Something is wrong with the pattern. Instead, the pattern is telling us something different. There's no time between when somebody leaves the track and when somebody gets buried.

DEL: So that would make sense if we're talking about layers that are laid down very quickly. We see this attempt of escaping death in trackways and so forth until we finally find their bones. Is that what you're saying?

MARCUS: That's exactly right. The animals are fleeing whatever is coming. They can sense that something is bad. They make their trackways; they're running away. The first wave doesn't get them. But maybe it picks them up later on and, as it washes back, buries them on top of their trackways. So there's very little time in the fossil record that's actually reflected by this. It's not long periods of time, slow depositional rates. These are fast, episodic events that are happening one right after another—killing and burying, killing and burying, killing and burying.

DEL: So when you talk about a trackway, let's talk about one of those things you mentioned before: the trilobite. Are they leaving, like, tunnels?

MARCUS: Sort of. There's these little fossils. We call them Cruziana, which is kind of a cool name. These trilobites are kind of cruising around. And what you see are all these little leg marks and push marks as they're walking around. When you think of a trilobite, you think of something like a horseshoe crab, as an animal. It's got this big shield and a bunch of little legs under it. And as it moves, it pushes the sediment away; as long as it's on the surface it's just kind of cruising around. And so there's some places, like South Dakota, where you can look at and see tons of these little trackways just above the Great Unconformity. You have the scour. You have tracks. And then you have dead trilobites. But the dead trilobites are not found first. The trackways are found first.

DEL: But the fact that those trackways are still there that should tell us something as well, shouldn't it?

MARCUS: It tells us two things. One, it tells us that the deposition or the placement of the next layer on top of them had to happen very, very quickly because, again, you go out onto a beach and you walk in the sand your trackways are destroyed very, very quickly. So in order to preserve a trackway, you've got to make it quick, and then it's got to be buried very, very quickly or else wind and water and erosion are going to destroy it. The second part is actually a little bit more subtle. It gets to another one of those weird patterns in the fossil record, and that is the lack of organisms in the sediment to churn it up. So when you were in the Grand Canyon you saw lots of layers. That layering is interesting, because in the modern world if you've got nice layers in the ocean—one right after another, all these nice little layers—well there's animals that dig down and eat all the organic material that's in those layers. You have worms. You have clams. And they're going up and down through all those layers, and as they do, they destroy the layers. But in the fossil record we have layers, and layers, and layers, and layers, and layers. Everything is these really nice, fine layers, and there's very little evidence of animals having the time to go and churn up through.

MARCUS: So this gets to that trackway: not only does the trackway have to be buried, because on the surface it's easily eroded; it also has to be buried very, very quickly because there are critters that, under normal, today's circumstances would destroy those things. But the fossil record is showing us something very different from today. It's showing us an environment where organisms are fleeing. They're being buried very quickly, and they're being buried so quickly that the animals don't have time to do their normal day-to-day life. The more sediment that piles up on top of them, they die. They don't have time to live their lives. Now we don't see them living their lives in the fossil record.

DEL: So it's almost like this snapshot of the steam engine where we still see the smoke because it hasn't had time to dissipate.

MARCUS: That's right.

Fossilization

DEL: Well, Marcus, I grew up on a farm, and on a farm you see animals die and rot. It seems to me that the fossils that we have had to have come from a different process than what I saw at the farm.

MARCUS: In the modern environment, fossilization is fantastically rare. It's really difficult to get a fossil because you really need the right kind of conditions. Out on the farm a cow dies, it gets brought over to a ditch, and it just sits there and rots for a long time. And the reason that it sits and rots is because it's not being covered up by sediments—by sand, silt, mud, clay. In order for a fossil to have a chance to be formed, an organism has to die—it has to be killed under a situation in which there's lots of piling up of sediment in it. And when you see things like the big nautiloid bed in the Grand Canyon, it tells you that all of these organisms had to be buried in one moment and then on top of them has to go a whole bunch of sediment. Otherwise other organisms, like coyotes, like ravens and all that sort of thing on the farm that are going to come and pick a skeleton clean—you've got to seal that away from anything.

MARCUS: And on land you've got certain animals and in the ocean you've got plenty of other animals like crabs, and lobster, and whatnot that go in and just start eating everything. And in the modern world today, when a whale drops out of the top of the ocean and hits the bottom, it is skeletonized, and then once the skeleton is there, there's more worms that go in and start chewing on the skeleton itself. There's no meat left. They're going after the other resources in the bones. So that whale becomes an ecological community to feed a whole bunch of animals because nature is very efficient at recycling. So to stop that process you've got to take that animal, that dinosaur—like the stuff that we see around here, the trilobites, the nautiloids—you've got to take them out of the equation. You've got to bury them in so much sediment that nobody can get to them. And the conditions for that to occur are very rare in the world today, and yet that seems to be the dominant mode of the rock record. It's fundamentally different from our own experience.

DEL: And the fact that we have so many fossils instead of millions and millions of different little special events; it seems more plausible that it was a single event.

MARCUS: It does, and recognizing also that the Flood is a single event, but a singular event. It's something that was altogether different from the rest of human history. And it's a complex sort of thing, and we as creation geologists are only really at the tip of the iceberg trying to figure out the dynamics of the Flood. We have this view that the Flood is kind of like Winnie-the-Pooh and the big rain in the Hundred Acre Wood. But the reality is this was a tremendously dynamic and destructive event that has a whole bunch of mini-events happening within it, and every one of those beds that has the nautiloids, every one of the beds that has a whole range of destroyed dinosaurs in them, every one of those is a particular event that's happening within the broader context of the destruction of Noah's Flood.

DEL: When we were in the Grand Canyon, we saw the Great Unconformity and there were no fossils to speak of, really, below that, and then all of the sudden we start getting a lot. What does that say to you as a paleontologist?

MARCUS: The Great Unconformity is telling me that there's some sort of massive erosion and shearing that's happening across the continent. And then once we start getting to those nice sedimentary rocks that have all the wonderful fossils in them, the pattern starts to emerge. The first is that the ecosystem that has the first animals in it shows up very suddenly. In conventional paleontology they call this the "Cambrian explosion." It's the first appearance of a wide diversity of different types of marine animals.

DEL: Is that why they call it an explosion?

MARCUS: Right. Because all of a sudden, within an evolutionary blink of an eye, you went from having very few animals of any kind—some sponges, some corals, a worm, or two or things like that—to having this massively complex ecosystem where you suddenly have trilobites and nautiloids and brachiopods, and a whole bunch of other funny terms we paleontologists like to use. All of a sudden you have this complex and whole ecosystem that shows up basically out of nowhere. Now that makes perfect sense from a Creation and Flood perspective because the Flood is about destroying ecosystems. And so the first time the Flood is destroying an ecosystem, it's destroying one that is complex and whole and structured. Whereas in an evolutionary view,

these ecosystems are going to have to arise a little bit more gradually as organisms diversify, evolve, and respond to one another in their environment. But that's not what you see. Instead you see an explosion of life that is complex, whole, the ecosystem is integrated with one another. You can see where all the different organisms fit with respect to one another. And that's just the first time that that happens.

MARCUS: Every time you move up in the geological column in this fossil record you start seeing snapshots of more and more ecosystems, and they're not gradually diverging or moving towards or away from each other. Rather it seems like you've got one ecosystem that's destroyed and then you've got another one. It's got slightly different creatures. There's different interactions going on. But from a creation perspective, what we want to do is kind of take that column of rock and tip it on its side and say this isn't life through time. These are ecosystems being destroyed from one phase of the Flood to the next. And the first one is the Cambrian and as the Flood waters move higher and higher they are getting closer and closer to the shore, destroying more and more organisms in the shoreline and eventually up onto land. And so every time in the fossil record that we come across these rock layers, these fossils and these death assemblages—really is what we need to think of them—is, wow, this is an ecosystem that existed prior to the Flood and is now being completely consumed in the process of destruction.

DEL: The fossil record as an evolutionary picture of life as it is developing is opposed to the Genesis paradigm that's saying, no, all of that life, all the complexity of life already was there and now we're looking at the graveyard of all of that life.

MARCUS: Yeah, it's actually kind of a fantastic irony that within paleontology they refer to the fossil record as 'life over time' and the 'record of life through time.' When, if the Genesis paradigm perspective is correct, then this isn't life through time, this is death in a moment. This is death in an instant. We're talking about a world that was complex, whole, integrated with each other and the Flood is destroying that world sequentially and burying it in a vertical fashion. And so we have the same data. The evolutionary paradigm and the Genesis paradigm are looking at these data together. We've got these same fossils. We've got these same museums. We've got the same stuff back at the museums where all the specimens are being housed. We've got the same rocks. But we're interpreting them in very, very different ways and trying to do that to the best of our ability. And so I think looking at the fossil record as a record of life is partly correct but it's not about life's development. It's about life's attempt to survive an event that ultimately consumed all of them.

Complexity In The Fossil Record

DEL: Marcus, Stuart Burgess and I were talking about complexity, the design of creatures. Do you as a paleontologist see that in the fossil record as well?

MARCUS: Absolutely. We see complexity in two levels. One level is in the integration of the ecosystem; you find as you start digging down that the complexity levels actually increase. They don't decrease. So in the Cambrian with the first layers of rock that have lots of fossils in them, you have things like trilobites that show up for the first time — looking from the bottom up. And

those trilobites, they are arthropods, so they are similar to insects, to spiders, to millipedes and things like that. They are in that large grouping of animals. And they have eyes and those eyes are complex. Not just a little complex, but tremendously complex. When we look at something like a trilobite, it has an eye like a dragonfly. If you looked at a dragonfly eye you see this beautiful, round eye and then up close you look and there's dozens of little lenses that make up that eye. So the dragonfly can see all over. You can never sneak up on one because they can see behind them, they can see above, below, in front. It's a beautiful structure that allows them to dart around the world. Trilobites likewise have compound eyes, one eye with dozens of lenses on it that allow them to see all over the place—behind them, in front of them, on the sides to avoid predators. For some of the trilobites, though, it got even better. There's a group called the Phacopsida and these ones have eyes that not only were able to see all around, but each lens was made up of two different types of minerals—biological minerals if you will—that allowed them to correct for what happens to water, and the distortion that happens in water. So if you try and look under water it gets all fuzzy and weird, and kind of gets circular. These eyes, in some of these trilobites, are the most complex eyes in the entire world. We don't even have them anymore. It took years, decades before Renaissance thinkers such as da Vinci discovered a way to correct, using lenses, for these types of aberration problems. God built them in the trilobites from the very beginning, and it took us thousands of years before we could figure out a design solution that could allow us to perceive light better than the trilobite did. And there's only two different types of lenses that we've ever devised that could do this. Trilobites actually have both of them.

MARCUS: And so when we think about the complexity of an organism, you can break it down to its component parts and look at the eyes and say these things are fantastically complicated, and it takes biological information to code for all of that. And then that eye also has to be wired into the brain in such a way that the brain is capable of taking in dozens of images at once and forming them into a coherent picture of the world for that organism. These are levels of complexity that far exceed any of our engineering capabilities. We can make drones and we can put a camera on a drone, but none of the cameras that we have built are anywhere near as complicated as some of the first eyes that we see in the lowermost ecosystems. It tells us that when these ecosystems were destroyed they were fully complex structures, fully complex organisms with fully complex components. The complexity just keeps going all the way down.

DEL: So again it makes more sense to think that that life that's in the fossil record was already there, and just got captured in its death moments, as opposed to thinking that this is a record that shows how life slowly began to evolve—because it's so complex from the beginning.

MARCUS: And as you go into the rocks below where the trilobites are, you don't find creatures that have slightly less complex eyes and slightly less complex eyes. That gradation that Darwin was expecting, and that my colleagues expect to find, is still not there. It's not that we haven't been looking. There are hundreds of paleontologists that have been doing a lot of good work over the past few hundred years, and yet the pattern still shows us complexity comes first, and variations on the themes of those complexities come later. That's exactly what we do as engineers and as intelligent agents ourselves. When we create things we come up with an idea. We create a pattern. We create a system. It's complex. It's whole. It's integrated. And then we decide we want to tweak it. Somebody comes up with an invention—it works but then the modifications come around. And, not that God has to modify His creatures, but the pattern of an idea and the

variations of those ideas are exactly the signal that we get from design systems, and not the signal that you get from things that arise organically out of physics and chemistry.

DEL: Do you see that same complexity in the design, as you see in the eye of the trilobite, now when we come to these amazing, engineered creatures that are right here in dinosaurs and the creatures that flew?

MARCUS: So, for example, we've got this Apatosaurus behind us. This is the long necked dinosaur. It's big and it's one of the largest animals ever to walk on earth. It weighed a couple of dozen tons. And it's got to be able to support that weight as it walks on land because they probably didn't spend a lot of time swimming in swamps despite the early dinosaur books that we had. These animals are built to be on land. Now that Apatosaurus—when you see the front legs down over there and down towards the toes, it's actually walking on its toes. It's fingers are like this. But the fingers have to—if you and I just tried to do that on our toes all day…

DEL: I wouldn't last long.

MARCUS: Not going to last long. So what we see is this integrated design. Our hands and our feet are more or less flat one way or the other. But the *Apatosaurus* and all of its close kin that have these big, long necks and these huge bodies; those structures are rolled into a column so that the weight can be distributed evenly amongst the toes that are going to the ground. There's probably a big pad of flesh down behind it to help add a little new surface area. Elephants do the same sorts of thing. These are the types of structures that are design marvels. They're engineering approaches to distributing weight. And even the long neck and the really long tail on these sorts of things are effectively cantilevers. They are held out by tendons and ligaments in order to keep them nice and stiff and straight so that you don't have to use a lot of muscle to hold up your tail. Instead, you've got kind of like an iron bar of a tendon holding these things out. So when I get a chance to look up close at something like this *Apatosaurus*, or any of the other dinosaurs and other animals that are out there, you start looking at the details of their anatomy and you go, "Wow, this fulfills this function. This does this role. This performs this for the animal." And this is not the sort of thing that ends up accumulating by happenstance. Despite natural selection's capabilities and kind of selecting things that work, natural selection tinkers with things, and tinkering is something that you can do when something is built. You don't tinker your way into a complex structure. You tinker around with it. And so looking at these animals' complexity from tip to snout, from one end to the other, and all of that, is shown in a variety of different skeletal structures.

DEL: And we're talking about exquisite design just within a land animal, but we also have not only sea creatures, but we have creatures that fly that for me is an amazing, amazing capability.

MARCUS: Yeah, they don't have jet propulsion. They don't have propellers. So how do they do it? And that's why birds fly and pterosaurs, which are extinct, fly. Those are the three animals that really have powered flight that are vertebrates. We have insects and they have their own amazing systems for doing these sorts of things. If you want to fly, you've got to be lightweight because you don't want to fly and be heavy. Pigs don't fly, as the saying goes, so you've got to be lightweight. Hollow bones are something that both pterosaurs and birds have in order to lighten

the weight. They tend to have very compact bodies. There's a couple of pterosaur fossils that are around here, and the middle of those animals are actually really small. Now a pterodactyl that has, maybe, a 20-foot wing span would still only weigh about the same amount as a Thanksgiving turkey. And when you think about that, that's an amazing sort of thing that this animal that is 20 feet long might weigh a total of 30, 35 pounds. Space saving, lightweight design, and the design of the wings is spectacular—and for a pterodactyl, actually, you have—their pinky is the big wing. They've got a couple of fingers that stick out, but those are to help them walk along the ground when they come down. But the pinky finger or really for us it's our ring finger, their ring finger is enormous and holds up to the end and there's a flap of skin that goes from there all the way down to their ankle. And that flap of skin is made up of at least three different layers of material that we know from soft tissue-preserved fossils. So we've got a chance to see a little bit of the actual anatomy in these. And you've got thin muscle layers. You've got a layer of blood vessels. You also have some specialized material that no other animal on the planet has got. In order to make this thing be what it does and scenarios in which evolutionists have got to produce these things—without any forethought to what's going on into the future—simply don't have the capacity to create something that complicated.

DEL: Marcus, this is very interesting to me because I remember hearing stories of how animals just all of the sudden grew wings, and yet what you're saying is that that animal had to be fully ready to fly—hollow bones and all of those kind of things. It couldn't just grow a wing and then start flying.

MARCUS: Right. And the mechanics of flight are very demanding, and as someone who has been in the Air Force, you understand that. So you can't just happenstance your way by growing a little bit longer wing digit or growing a little bit smaller body trunk or growing a little bit more feathery fluffy material in order to eventually become a bird. There's got to be functionality from beginning point all the way to the end. That's a very demanding sort of problem. What good is half the wing going to do for you because it's not going to help you run and it's not going to help you fly. There seem to be certain types of engineering thresholds where you either become good at doing this or you become good at doing that. And we make this with machines and with vehicles all the time. People have always tried to make a car that can fly. All kinds of folks have tried designs for this and, in the end, none of it ever works because there's a certain practicality that's necessary for being on the ground, and there's a certain practicality that exists for being in the air.

Carnivory and Violence Before The Flood

DEL: Marcus, when we go to a zoo, we kind of feel at home because all the animals are familiar to us, but we walk into this zoo and it's obvious it was a different world. Is that how you see it?

MARCUS: Yeah, it's a completely and totally different world, and one that doesn't seem like it was altogether a pleasant place to be. You've got these animals right back over here locked in combat, but we also know from the fossil record that that's really what was going on. You've got evidence of carnivory. You've got evidence of animals attacking other animals. Amongst the *T. rexes*—they were fighting with one another. All these sorts of things. There's cannibalism. There are evidence of tumors and cancer. It seems to be a world that is racked in pain, and

that's precisely the picture that we get looking at the Genesis text. And that's not the way it was supposed to be. When God first created the world, he said it was very good. He told Adam and Eve: eat plants. He told the animals: eat plants. And yet this is the picture of what we get by the time the Flood happens over 1600 years later. So there's a big shift in what has happened between Creation week and the good creation that was there, and we get a chance with these fossils to see what the world was like before the Flood as sin had completely corrupted the world. It's to the point where God said, "I'm going to blot out mankind, that the whole world is filled with violence, that the end of all flesh is coming." All of this has got to go away.

DEL: So we're talking about a major change that occurred at the Fall, correct? When creatures that were made to eat plants and so forth have now become ferocious animals.

MARCUS: Things like *Tyrannosaurus rex* eat meat. There's no doubt about it. The fossils that we have of these animals—they are carnivores. The raptors are eating meat. Some of the creatures that we see in the oceans—they're all eating each other. And you have other animals that are eating plants, the sauropods, the long necked dinosaurs, and all these sorts of things. When God pronounces a curse upon the serpent and says 'cursed are you above all cattle, above all beasts of the field,' it seems to indicate that, yes, the serpent is getting a particular curse because of its role in deceiving Eve in the garden, but more than all cattle, more than all the beasts of the field seems to tell me that the curse's effect is being brought out much, much wider. It's affecting the entire economy of creation. Going from a world that was peaceful, one that did not include animal death, one that was built upon herbivory to one that now is rooted in selfish actions of all men and animals. And if the plant world is the only thing that anybody can eat and the world has just gotten very, very selfish, then the plant world is in for a lot of pain. And within creationism we've got a lot of different ideas about what the Fall did or what God's actions might have been, but in my view carnivory might be one of those types of solutions to protect the plant world ultimately from being destroyed by selfish herbivores. And so when we look at these animals that are so ferocious and fierce and destructive. Part of that just might be the way it needs to be in a world that is fallen. It's a sad situation and obviously by the time it got to the Flood it was so awful that God had decided he's going to completely destroy the planet and start over fresh.

DEL: That would make sense, then, because when God is talking about destroying the earth with the Flood, it wasn't just the destruction of human life, it was the destruction of all life. Are you saying that that violence extended not just through humanity, but it extended through all of the creatures as well?

MARCUS: As we look through the Flood narrative, what we find is that God spends a lot of time talking about animals being destroyed: creeping things, the birds of the air and the beasts of the field. These terms are used over and over again, but these are also the same animals that God instructs Noah to put on the Ark so that there is a means of salvation for them. There's a means to survive. So there's mercy in the midst of destruction. The world is fallen, but there's still a way through. God still provides for his creation. Now it means also that the world that we live in now is radically different. It's not the same and it seems like the world that we live in now wasn't established on the same basis of animals and plants that the world prior to the Flood was. And so we as creation geologists and paleontologists and biologists try to think about, well, what is it about the Flood that so changed the world that when all the animals got out on the other side

that the same ecosystems didn't get themselves reestablished. It's like this world that we live in is a disaster recovery world and it doesn't reflect the beauty and the richness and the fullness of the world that used to be before the Flood.

DEL: And to some extent that's what we see in the passage that we read in Peter where he said that the 'world that was then was destroyed' as if there was a really different world. And so now the world we live in is, as you said, radically different than what that was before.

MARCUS: Yeah. We need to really, really change our perspective when we think about what the world was before the Flood. We tend to think of the continents being in the same places. We think of Noah's Ark being, basically, a zoo of African animals with giraffe heads sticking up out of the top of it. We think about the modern animals. We think about modern people. And all of that needs to be scrubbed. All of that has to be driven from our mind because the world before the Flood was very, very different. It was this. It was more, but it was all of this before the Flood. And after the Flood as the world reestablishes and plant communities take over they seem to have done so slightly differently than the way that they did at the beginning. It's kind of like after a giant forest fire. If you've ever been in the part of the country after a forest fire, there is a logical progression of several different types of plants. So think of the Flood like a giant forest fire, only afterwards, because the world has been scrubbed clean, maybe only the first disaster things like the weeds and the grasses and the birch trees that usually follow after a fire—those get established but the other plants that were the basis for the world before the Flood, they didn't get going and so some of the animals that need those, they didn't make it through.

Changes Brought on By The Fall

DEL: Marcus, when we go back to the Fall, God was talking about the curse, including things like thorns and thistles. It appears as if there might have been a genetic change. Is that how you see that?

MARCUS: I think that's reasonable, Del, to think about that and the advent of thorns, the advent of thistles, the idea that the plant community is now, in a sense, re-engineered to defend itself against or to resist the actions of mankind in tilling the earth, and the advent of carnivory, that animals are not intended initially—if you read Genesis 1—and what's going on in day six, God tells the animals right after he tells man, "I give you every green plant for food." And yet here we are in a natural history museum that preserves for us and displays for us the animals that were killed during Noah's Flood. Now that's over 1600 years later. So there has been a progression of time from the Fall and the curse to the time we get to Noah's Flood for the world to descend into the chaos, the violence, the evil that it has. But I think you're right that there is a genetic component to what's going on in the Fall that reworks the economy of creation in some way to introduce carnivory, to introduce defense for the plants from herbivores that are going to be selfish and want to eat too many of them, and to resist our role as stewards and dominion-rulers over the planet. It's a tough thing, but God knew what he was doing when he put this curse into effect. It was a necessary thing based on what had happened in the Garden.

DEL: So we have this 1600 years of growing violence that, as a result of the Fall, now leads us up to this great cataclysmic judgement that God brings upon a world that we see was highly violent, wasn't it?

MARCUS: It was. The images that we have such as behind you with this tyrannosaur that is over the top of a duckbilled dinosaur, or locked in combat with a triceratops—you go to any museum in the country and you'll see something like that. But it's born from the evidence of the fossils. The teeth of the *Tyrannosaurus rex* are not built for making salad and his arms are too short to eat the salad anyway. When we think about what a *T. rex* is built for, it's built for eating meat. And whether that's scavenging dead animals or whether that's hunting down and killing its own—and it probably did quite a bit of both—no matter what those teeth, those claws, those behaviors are all about carnivory. And for every *T. rex* you could point to, there's also a *Velociraptor* and *Deinonychus* and an *Allosaurus*. And when you get outside of dinosaurs you see crocodilians. And in the world today we still have some fierce animals. We're humans and we've mastered much of this world, but push comes to shove if I'm just out hiking and there's a grizzly bear, I'm not going to win that battle. The world is still filled with violence, and that's a reminder to us about the still-fallen nature of how far we've come from an initially good creation to a world that was then destroyed to a world that we're now in, which is a shadow of its former glory.

DEL: Obviously the creatures that we see here that were captured in that cataclysmic event are no longer here. What do you suppose happened to them? Did they survive in the Ark? Did they not get there? What happened?

MARCUS: So all these fossil bones that are out here are from ones that have been excavated and recovered from rocks that were laid down during Noah's Flood. And then we have the question, "Okay, well, were dinosaurs brought on board the Ark?" If the earth is only a few thousands of years old, and God said he brought each and every creature to Noah to put on board the Ark, were the dinosaurs on there? And most creationists would say 'yes, dinosaurs were put on board the Ark'—God said I'm going to bring two of every kind of animal. That's not two of every species, so we don't need this Tyrannosaurus rex and we don't need its close cousin—which there's a dozen species of tyrannosaurs. You just need one pair to represent that kind, that group. The question then is, "What is the world like after the Flood, and how is it that the dinosaurs didn't end up reestablishing themselves as the dominant group of animals on land, which is what they were?" And that is a very mysterious question. It's one that creationists, I don't think, have a really great handle on. I certainly don't have a firm and solid answer on that. It could be that the plant communities upon which they're built—in which their ecosystems were structured—did not recover after the Flood. The point of the Ark is to preserve the chance of life. It's to preserve animals that are in the world before the Flood and give them a chance. But there's no guarantees that God makes to those animals that every single one of them is going to survive and be fruitful and multiply. He tells them be fruitful and multiply, but the idea of extinction is not something that God says, "No, we can't have that ever again." Now we know from humankind we've driven animals extinct. Did we drive dinosaurs extinct early on because we decided that there is no way on this earth that we wanted to live next to these things? Those are possibilities, and ones that I think creationists have a lot of work ahead of them to try and sort out.