Dwayne: Hello, welcome to episode twenty-five of the Metaphysics of Physics podcast.

I am Dwayne Davies, your occasional host. Today we are going to interview Warren Fahy, the author of the bestselling books Fragment and Pandemonium.

Some of you may not know what these books are. Well, Warren is going to tell us all about them in a little bit. But they are science thrillers something along the lines of Jurassic Park.

You can probably gather by the fact that I am interviewing him about these books, that I have read them and probably enjoy them. Yes, I have read them and I do enjoy them.

Fragment and the sequel are amazingly interesting books with some extremely compelling biological theories.

There are some truly terrifying, nightmare creatures in both of them. They make the dinosaurs and monsters in other books seem tame. Dragons? T-Rexes? The critters in these books, such as spigers are much deadlier and scarier.

I also quite like the main cast of characters, but I cannot talk about that very much without spoilers. But two of them are biologists and they may or may not have some fascinating biological ideas, new and old.

Highly recommended. But more than that and as entertaining as the scary monsters are, you might also learn something reading this.

All right, now we have that out of the way, let's get back into things.

Alright, thank you for being here Warren.

Give us a brief introduction to Fragment and Pandemonium. Later questions will focus more on the science and the like, so maybe, for now, focus more on the theme and the plots.

Warren: Perfect. Well, Fragment and Pandemonium are science thrillers. They are somewhat in the vein of Michael Crichton books, which happened to be my favourite kind of thriller.

I like to read a thriller, get something out of it, get some new information and to learn something. So that was the kind of book I decided I wanted to write.

Since I was a kid, I've been writing. And I have been studying evolution ever since I dug a fossil out of the hills behind my grandparent’s home when I was eight. And ever since then I've been fascinated by evolution. And so, I decided to mine that avenue for a thriller.

I hadn't really seen anyone ever deal with the concept of a completely separate evolution that was isolated and went off in a completely different direction. Resulting in an entire ecosystem of almost alien creatures. If you went back far enough, I figured you could make a very compelling world.

And so, Fragment is a story of a fragment of an ancient supercontinent that had been isolated for 550 million years. And which was lost in the middle of the South Pacific Ocean in the middle of the Roaring Forties. Which is a current that ships try to avoid in their shipping routes.

I decided to put a reality TV show that is circumnavigating the world, in the path of this island. And what they discover, of course, is an alien world. Such a dangerous world that they're almost all slaughtered on live television as they land.

And this calls attention to the United States government. The Navy isolates the island and sends in a team of scientists to find out what in the world is going on.

And what they discover is a world that if any of the species from it were to escape, and get to the rest of the world, it would be only a matter of time before they knocked out the legs from every single ecosystem on planet Earth. And so, that's the premise of Fragment.

And Pandemonium is the sequel. It has some of the survivors moving on to yet another ecosystem that has been isolated in a giant cave system under the Ural Mountains in a fictitious country.

And within that cave system, the former Soviet Union has built a gigantic city from which to escape any possible pandemonium from any kind of worldwide nuclear conflagration.

And so, then we discover an entirely different universe of creatures. We discover an ecosystem that descended not Cambrian era like Fragment but descended from the Devonian.

One in which the ecosystem is chiefly mostly molluscs instead of arthropods, like the Cambrian era descendants. And so, we once again we have another entire menu of crazy monster animals to deal with.

So those are the two science-heavy books and they incorporate a lot of different new theories and required a lot of interesting research.

Dwayne: Well, that fossil you dug up when you were eight, did you ever find out what it was?

Warren: I did, it was just one leaf from a fern.

And my uncle was a geophysicist. And he identified it for me. He had collected a lot of trilobites from a nearby quarry and that had those really fired my imagination.

So, many years later, I would write Fragment about a world that had descended from that era, the era of trilobites. But what if they had gone off on their own way separate from everything else on planet Earth? What would they look like half a billion years later?

Dwayne: Hmm, OK. Now we can talk about some of the science ideas in the book. Tell us about some of those.

Warren: Well, since I've been studying evolution since I was a kid, I have been sort of a like an armchair biologist. I have always been endlessly fascinated by the process of evolution.

And three theories along the way occurred to me while I was studying various aspects of evolution. Two such theories are presented in Fragment and they are original theories.

One of them has gotten some interest from some actual geneticists who are studying lifespan. And that particular theory the theory of lifespan describes what dictates the lifespan of all species on Earth.

It was, basically, derived from looking at barnacles. And barnacles are something that fascinated Darwin to no end. They are amazing creatures which people don't seem to really understand.

They are crustaceans like crabs or lobsters. And they're obviously the weirdest crustacean on earth. And they only live for about two years. But mussels, that live right next to them, have almost an unlimited lifespan. They can live up to 70 years.

So, I was thinking, why in the world, would these two species have such a vastly different lifespan? And as I studied it, I realized that there was a difference between the way they procreate.

Of course, mussels procreate by this huge bloom of sex cells that they all release all at the same time. Trillions of cells that drift in a cloud and end up creating the next generation.

Barnacles, however, have the largest sexual member in proportion to body size of any animal on earth. They must procreate by literally reaching it over to the next neighbour next to it in order to inseminate that neighbour. That is how they create the next generation.

So that was a clue and the fact that they reach sexual maturity in one year and die. The fact that they die by the time their offspring reach sexual maturity was a giant clue.

Of course, all species on Earth become unable to procreate if they mate with their offspring. And there are all kinds of different reasons and biological barriers that stop that from happening.

And if they didn't stop that from happening, then that species would die out in very short order. Even plants that procreate with their own offspring will become unable to procreate in only two or three generations.

So, as I started to check this theory out by looking at animals and plants with lifespans, I found that the theory held true with absolutely every species across the board. Any animal that could theoretically, crossbreed with their own offspring had a fixed lifespan at twice the age of sexual maturity. So that they could not compete with the next generation and mate with their own offspring.

And this is true from everything from redwoods and sequoias, to whales and to any species, you can name. But certain species get around it without lifespan, because they don't need it.

For instance, the sequoia has made the same way that mussels do. Or the coral reefs do with giant clouds of sex sells that are all released at once. And the chances of them breeding with their own offspring are so slim that they're infinitesimal. They are vanishingly small.

If you look at something like some whales, they congregate in giant groups and they don't meet for life or anything. They just randomly mix in and they meet several times a year and that makes it impossible for them.

So, certain bowhead whales have been discovered to have lived about 250 years for instance. And sequoias live to 3000 years, virtually unlimited lifespans.

However, then you look at animals that live in small groups, rabbits, for instance. They reach sexual maturity in a year and they die at two years. Because they're in a small group, right next to their own offspring and they must just die off so that there's no chance.

For instance, take turkeys. They are these virtually flightless, very stupid birds that kind of move around in the same area and die in about two years. After one year they reach sexual maturity Two years later, they die.

Ostriches, they made for life. There's no risk of them ever mating with their offspring because they mate for life. They can live sixty, seventy or eight years.

The theory absolutely held true all the way through. So, I decided to include that as one of the characters own theories. The two protagonists are scientists in the book. And they believe that you should always think outside the box when you're trying to analyse what's going on in any particular biological system. And so, I gave these theories to those scientists in the book.

The second theory is about life, about the origin of sex. About how certain cells were carnivores. Single-celled animals used to attack other single-celled animals. And they ended up mingling their DNA.

It became a profitable solution to the predator-prey relationship. Males would end up inheriting genes from the females. And the females, likewise from the males. And that would give them an evolution in tandem as they became partners instead of enemies. And that's one of the theories.

And in then in Pandemonium, there's the theory of human evolution. People would often say, well, how is it possible for human beings to have evolved so rapidly and in such a direction that conforms so perfectly to the needs of a highly sentient creature?

For instance, developing vocal cords, the dexterity of our mouths and tongues and the ability to make so many different sounds in vocalization. Or opposable thumbs that are so perfect for making tools. And how did all this dovetail so perfectly with the needs of an intellectual animal?

And so, the theory is that we have, in a sense invented ourselves. The first time an ancestor of human beings decided to use language, it set a new stage for success. And any one of the descendants of those animals that had developed the idea of language culturally, would then select for all those within that group that could utilize that idea most successfully and therefore pass along their genes to the next generation.

Whereas those who are less able would have less of a chance to pass their genes on to the next generation.

And so, every idea that humans came up with, set the stage for a new selection process from that point forward. And therefore, we evolved to express our ideas. And then that way, in that sense, we invented ourselves, sped up our evolution in a particular direction.

So those are the theories that are presented in the book as Fire Breathing Chats which are delivered by the main protagonists of the books.

It's a long-winded explanation, but they are scientific theories.

Dwayne: All right, in one of the Fire Breathing Chats, Nell mentions how Dawkins meme theory is something of a corollary to the theory of self-directed human evolution which you were just talking about. Would you care to elaborate?

Warren: That was the theory that ideas or memes translate into genes. That our memes are selected for and they select our genes moving forward so that they have a very close corollary and very close interaction in evolution.

It's true too for other animals. For instance, take animals that are driven out of their habitat and which now different sources of food. They will start to evolve if their behaviour changes to utilize those other sources of food. They will start to evolve to capture that food in a more efficiently.

So, ideas and behaviour dictate evolution. And in that sense, we sort of direct our own evolution and human beings have directed their own evolution.

Dwayne: And in that same section, you mentioned the thing that distinguishes humans from the rest of the animal kingdom. Would you care to elaborate more on this what this thing is? You kind of touched on I think, but yeah.

Warren: Yeah, I will sum it up. There only two species that direct their own evolution. By first coming up with an idea that they may not be completely capable of executing.

For instance, the first time someone picked up a rock and said, Look, we can make a tool we can make a sharp edge if we smack these together.

That creature may not have had very good opposable thumbs. He did have the idea, however, to make this. And from that point forward, all the other members of his group, if they had better thumbs would be more proficient at using that idea. And they would, therefore, be more successful at mating and passing along their genes to the next generation.

So, the idea would end up selecting the next generation and the next generation, the next generation and each one would have a better facility at using tools and with hand-eye coordination, opposable thumbs, etc. And even brain centres that were needed for that activity would be selected for moving forward.

And so, we have created ourselves with our ideas.

Yeah, kind of it adds a corollary to Dawkins theory.

Dwayne: Okay, you've touched on this one too. What inspired you to write Fragment and Pandemonium?

What were some of your influences?

Warren: Well, there was one specific thing that gave me the idea for Fragment. I was studying the discovery in Romania of a cave called the Movile Caves.

It was isolated for five million years. There was no contact with the surface whatsoever. And when researchers went down into this cave, which was about the size of a cathedral, they found a lake that was covered with a thick mat of microbes and had been completely cut off from sunlight.

And yet in this cave existed 33 species that didn't exist anywhere else on the planet. And it was only after 5 million years of isolation.

So, it occurred to me that there are many lost world novels and adventure stories. Where usually you have the world frozen in time, right?

That's the original Arthur Conan Doyle lost world scenario where these creatures have been isolated, they've been frozen in time. And now there's dinosaurs and all kinds of primitive, prehistoric creatures.

That's not really the way evolution works, though. When things are isolated, they start drifting genetically away from their starting point when they were isolated. So, the idea was that we could that you could create a lost world scenario for an adventure story.

Based on long term isolation, that would create almost an alien world right here on planet Earth. The idea immediately formed in my mind and that's when I started work on it. So that was the original inspiration.

Dwayne: Yeah, I thought that was weird. That whole frozen time thing. I mean, I don't know why, you know, anyone who understands evolution would think that.

But Conan Doyle had all kinds of weird ideas, I guess.

Warren: Yeah. And I think at the time that the idea of evolution hadn't completely sunk in. And so, people were looking for living fossils, basically.

And they were looking for throwbacks, that were clues to evolution. But they weren't really thinking about the fact that isolation would actually create a genetic drift into a different direction. We are much more sophisticated now than they were then.

Dwayne: This was back when they still believed Richard Owen’s idea of dinosaurs being slow swamp-dwelling critters.

Warren: That's right. Yeah, there were a lot of mistaken ideas at that time, it was also new. But now, it was time for an update on that idea.

And so, I decided to go all the way back to the Cambrian explosion and say, wow, look at the species in from this time. And imagine if they had just continued in an unbroken line from that point, isolated from all the rest of the world. They've gone through so many environmental upheavals that they kept getting thinned out by extinction events.

But this particular fragment of a supercontinent that continued to dwindle down to like a two-mile-wide radius had been an unbroken part of the world where that evolutionary progress continued and was never interrupted. So that's the basis of how Henders Island came to exist

Dwayne: Tell us about any real-world islands or caves where some unusual wildlife has been found.

Warren: Oh yeah, well there are terrific ones. About a couple of months after Fragment came out in the US, a team of scientists from the Smithsonian Institute visited Papa New Guinea and they explored the Maasai crater.

It is almost the same exact size of Henders Island and it is at the bottom of this volcanic crater. The life inside this crater had been isolated for millions of years.

They found kangaroos that live in trees and frogs with fangs and rats the size of dogs. An entirely different ecosystem was dwelling at the bottom of this crater and it was absolutely stunning to them. They explained it as if there was an island in the middle of nowhere isolated for millions of years and all everything inside it had drifted in its own direction.

So that happened two months after Fragment came out. And it was I was pretty amazed by that.

But obviously, take Australia, New Zealand, Madagascar, the Seychelles. These are all places that are known for their distinct species and very interesting throwbacks. Such as on Australia, where everything proceeded from marsupials and the age of placental mammals never arrived there.

So those are obviously great examples. But I think my favourite is probably Socotra Island where the tree species on that island and almost everything on the island looks like it came from an alien planet.

The tree species were a big inspiration for the “tree” species that are on Henders Island.

And there are caves too. For instance, there was a cave discovered in the Sequoia National Park. Now, cave species are almost always completely distinct species that are nowhere else to be found.

This cave system was no different. Some of the species inside the cave evolved to live in only one room of the cave. So that's how specialized they had these creatures had become just because they were isolated inside this cave.

Dwayne: Hmm. Okay. What are some of the weirdest real-life species, extinct or extent? Which ones might you like to talk about here? I guess

you've covered some of them, but there are, of course, lots of others you haven't covered.

Warren: Yeah, certainly. Well, of course, stomatopods or mantis shrimp feature in the book quite a bit. Those are some of the most extraordinary creatures. If there was ever going to be a creature that replaced us on planet Earth, I like to think the mantis shrimp would be that creature.

We have three colour receptors. Mantis shrimp have twelve so they see millions of colours we can't see.

They have a punch with some of their four legs which can shatter bulletproof glass.

They have incredible sight acuity; their eyes have three different pupils in each eye. So, they see more with more than stereovision with each eye. And so, that enables them to track fast-moving prey and strike it at as it is moving past much more efficiently than any other animal on earth.

And so, they are and they have a nervous system which is extremely advanced so they're amazing.

Octopi have arguably nine brains eight for each of their arms.

I love to see treehoppers; they are one of my favourite animals. Just because they have the most insane shapes, sizes and colours. They are tiny little insects which jump around on plants and trees. They are almost everywhere and in every backyard. There are literally tens of thousands of species around the world. Mostly overlooked because of their size, but they're incredible.

Then there is an infinite number as you can see on my website. I am always posting about a new species on my Facebook page every day. Just to show the vast variety of amazing creatures that are out there. Some of which I did not find out about until after designing the creatures on Henders Island and in Pandemonium. Both entire fictitious ecosystems in both books.

I was mostly trying to come up with creatures that locomoted in a completely alien way. And some of the creatures like Henders rats and spiders locomote with a tail that springs and lunges them forward through the trees.

And I thought okay, that's going to be something completely new. But it turns out spring tiles had been around forever and they do exactly the same thing.

And of course, the idea of the disk ants which roll. That's the way they locomote. I thought I'd never find anything like that. But there are spiders that I found out after the book came out that do, in fact, turn on their sides and roll down sand dunes in the Sahara Desert.

So, almost anything you can come up with that is at least physically possible has been tried out by evolution.

And that's one of the most staggering things about, about the planet. There's so much that we can't imagine. And even if we could it's already happened.

Dwayne: I know it's hard to think of something which evolution hasn't already tried.

Warren: Indeed.

Dwayne: Okay. Why do you think that knowledge of evolution, biology, anthropology, etc are important? And why do you think so many people want to pretend that it isn't?

Warren: Well, I think one of the reasons is that people intuitively look at human beings and say, this can't be the process of evolution. It must be God that created this because we are so perfectly adapted to the life of an intellectual creature. It seems like an end that the mind of an intellectual creature created us.

And my argument is yes, that's correct. But we are that creature that created ourselves.

And it's important to understand that because there tends to be this conflict between evolution and Creationism. That says something as specifically evolved to be human could not have just come about accidentally through a giant chain of accidents.

And I would say that's correct. It is not in conflict with the scientific theory of evolution. However, we need to understand that our ideas have directed, specifically our own evolution.

And so, it reconciles that problem that otherwise people would say, oh, it's got to be a divine spark. Well, yes, in a sense it was but it was our

selves that created that divine spark and that directed the way we would evolve moving forward.

So, we are different from all other animals in the world in that way. That is why we seem to stand so far apart from other animals. That is a very important thing to understand. Rather than have this endless irreconcilable conflict between religion and science.

Dwayne: There is this other idea that the moment we developed opposable thumbs that we started to direct our own evolution. That is not quite what you are proposing, but it is kind of similar.

Warren: It's kind of similar. I would say that it's a little bit the cart before the horse, though.

In the sense that I think that maybe the first person who came up with an idea that required opposable thumbs was probably pretty clumsy at trying to put that idea into effect.

But as soon as that idea took hold, any other member of the group who had a slightly better arrangement of thumbs and hand would obviously be instantly much more successful. And would pass on their genes more successfully to the next generation.

So, the idea would come first. First, somebody came up with the idea of what way we can use a sound to signify something out there. Maybe it was just a grunt and that meant mastodon.

And as soon as that idea of using language to name things in the world took flight, then, of course, people who could make more distinguishable sounds became very successful within that group and in that culture. They would be more likely to pass on their genes and the following generations would get better and better at utilizing the idea of speech.

So, the idea must come first and set the stage for success. And then everything that implements that idea more successfully has more children and therefore passes along their genes more successfully. So that's the order of things I believe.

Dwayne: I mean, right. I mean, we're not the only hominid species to have had opposable thumbs. I mean, the Neanderthals had them, but they are not around anymore.

Warren: That's right. They're not. And at one time, there were at least like five or six different kinds of human on planet Earth at the same time;

the Neanderthals, the Denisovans, the Homo erectus, the hobbits as they're called on the island of Flores, and Homo sapiens. And they all coexisted at one time on planet Earth.

But it was the most successful species of those us that ended up getting through the bottleneck and surviving today.

Dwayne: I wondered how long it would take for someone to mention Jurassic Park. By the way, I think your books are a lot scarier than Jurassic Park.

Warren: A lot of people tell me that. It was meant to be. But of course, I couldn't possibly have written the book without the great Michael Crichton blazing the trail.

Here is an interesting little story. Kind of a bittersweet story. When I first submitted the novel to publishing houses, there was a bidding way at Harper Collins in England. This was at the London Book Fair and Harper Collins won the war.

And I went to London to meet my editors. They said, how did you do it? We get 2500 wannabe Michael Crichton novels every single year and all of them are terrible. And how did you do this? And I said, I gave credit, where it's due. Crichton was a great example.

And then a woman came up to me at this party and she had tears in her eyes. She said we're so privileged to publish your novel and thank you very much for going with Harper Collins. And I said and oh, well, that's my honour, thank you. And then she left.

And then they told me that's Michael Crichton's editor right there. And then after the party, some people rushed up to us and said, we have terrible news, Michael Crichton just died. And that's why his editor had tears in her eyes.

So it was, it was a real shock. And I had hoped to meet him, really. And that was as close as I came.

Dwayne: How many times did you read Jurassic Park when you were younger? I was pretty … dinosaur crazy or something when I was a kid. I read that book like eleven times or something insane like that.

Warren: Well, I read very slowly and I read a book once and I just absorb it completely.

That is because I'm really looking at sentence structure putting, the overall story structure and all those things when I'm reading.

So, I rarely revisit books. I just sort of like mimeograph them in my mind. Have them there at my disposal mentally.

Dwayne: Okay, and what are some of your favourite books in these fields?

Warren: I think one of the great pleasures that I've had through the years is watching David Attenborough's documentaries and reading his books. I read Life on Earth, for instance, and some of his other books.

I got a DVD player that plays United Kingdom region DVDs just so I could watch the unabridged version of Life on Earth. Which is about ten times larger than the one that was available in the United States. And it goes through the entire evolution of life using living examples that still represent each stage of evolution. So, those are great.

Carl Sagan books are great popularisers of science that are great for people are just starting to look into these things.

Obviously, there are lots of textbooks but they are very dry. I did study biology in college and those were very useful but I wouldn't be able to name the author or the titles off the top of my head. They're just very dry tech type books. But those are terrific.

I also am very fascinated by ediacara. Which were some very mysterious groups of animals that existed before the Cambrian explosion. There are theories that they all died off completely and were replaced by the next generation of animals.

There was a book called The Garden of Ediacara by Mark McMenamin, which was very fascinating. I really enjoyed that.

So, those are great starting points. As well as Crichton of course, you can learn a lot from Crichton books.

So those and documentaries and dinosaur books are always fun. A lot of those.

Dwayne: I have been reading a lot of Donald Prothero lately myself. Have you read any of his books?

Warren: No, but I loved the books that were by Stephan Jay Gould. The Wonderful Life: The Burgess Shale and the Nature of History is a terrific book.

And the Origin of Species is a terrific book.

But Stephen Jay Gould is a really exciting writer and it's really fun to look at some of his theory.

If you would like, I can read a couple of quotes to you from Stephen Jay Gould's Wonderful Life. So that you can see some inspiration for Fragment.

Dwayne: Oh, yes, please.

Warren: All right, here is one:

"Alter any event ever so slightly and without apparent importance at the time, and evolution cascades into a radically different channel."

That is s from Wonderful Life: The Burgess Shale and the Nature of History by Stephen Jay Gould.

Here is another:

"Some fifteen to twenty Burgess species cannot be allied with any known group and should probably be classified as separate phyla.

"Magnify some of them beyond the few centimetres of their actual size and you're on the set of a science fiction film."

Here's another, I will give me one more:

"If Ediacaran survivors had been able to evolve internal complexity, later on, the pathways from this radically different starting point would have produced a world worthy of science fiction at its best."

That is another quote from that same book. So yes, those were inspirational.

Dwayne: I don't think I've read that one yet. I should read that one.

Fragment has a whole bunch of crazy and fantastic arthropods and Pandemonium has a lot of a lot of weird molluscs.

Did you choose these phyla because they are so diverse and amazing?

Or because they are personal favourites of yours all or what? I guess a bit of both really.

Warren: Yeah. Oh, absolutely. Both. And, because they both emerged long enough ago for them to have had plenty of time to evolve in a lot of even weirder directions.

Something that was too recent would make it difficult to account for very imaginative evolutionary adaptations. So, I decided to go all the way back to when cephalopods first appeared. When they had an entire dynasty where they took over the world. Just like arthropods had before them in the Cambrian era.

Those are long away enough times, like 550 million years for arthropods. As for cephalopods; even though they were around during the Cambrian, they didn't really take off until the age of ammonites that filled the seas with these giant nautilus-like shells. And created all kinds of different kinds of species that blossomed during that age. And that was about 300 million years ago.

So that was enough time for them to adapt to these isolated ecosystems on, for instance, Henders Island, or in Pandemonium, the cave system under the Ural Mountains.

And of course, yeah, there's enough variation of those species to have all kinds of stuff to choose from for creating amazing animals.

Dwayne: What are some of the most controversial, biological ideas which you are the most interested in?

Warren: Well, of course, genetics is the whole future frontier, that is unquestionably the most interesting.

But the thing I'm most interested in is the fairly new emerging science regarding epigenetics. Which really challenges a lot of concepts of evolution.

There is a big debate historically in biology between the Lamarckians and the Darwinians.

Lamarck believed, for instance, that the reason that giraffes developed long necks was because they kept reaching up higher into the trees to get leaves to eat. And because they kept straining their necks upward, their children inherited longer necks.

That was the Lamarckian theory before Darwin came along and said, no, it's natural selection. And he had a completely different theory of how things evolved. So, that was the argument for so long.

And now epigenetics comes along. And that is the idea that genes are modified by certain behaviours during a person's life. Which almost starts moving back towards a Lamarckian idea that genetics can be affected by behaviour. And that those genes can then be passed on to the next generation. That is a most fascinating new frontier.

I think that the other most mysterious group of life would be the fungi. Some of the very oldest species or group of animals to appear on planet Earth. They now believe that the first fungi existed far past 1 billion years ago. Which is certainly before almost every other kind of life. So, I think that's a frontier that I would love to explore in a future book.

Dwayne: Speaking of which, tell us about your next book. When can you read it? And when you finish it, where can we get it?

Warren: Well, the next book and the final book in the Fragment trilogy will be called Symbiont. And we'll explore the world of fungi. It will be set in the Pacific Northwest, in deep old-growth forest. And I really don't want to say too much about it.

But it will include some of our favourite characters from the series. It will probably be finished within a year and after that, it will be available wherever books are sold.

Dwayne: What are some of your favourite books and authors? I think we've pretty much covered this.

Warren: Yeah, sure. Well, I don't read a lot of contemporary fiction I mostly read classics and nonfiction. But obviously Crichton and Conan Doyle. I love all the Sherlock Holmes stories, I really do, they are wonderful.

And then there is Victor Hugo. Martin Amis is an amazing author. Mark Twain is fantastic.

I love style stylists like Flaubert, Bukowski, Fontaine and Hemingway.

Agatha Christie is really great, really fun. Stephen King, some of it is fantastic, I really love it. Prince of Tides is an amazing book by Pat Conroy. Tolkien and Asimov and Bradbury, Cornell, Philip K. Dick. McMurtry, Raymond Chandler, James M. Kane.

Frankenstein's an amazing book. Homer as well. Maybe Ursula Le Guin. A lot of great writers and great stylists with very distinct voices.

Dwayne: Hmm. Okay, and what are some of your biggest literary influences? Whoops, you've kind of answered this too to some extent.

Warren: Well, yeah, I mean those all probably all the books that you read, add to the stew of your own style and your own influences.

I would say all of those certainly have added something along the way. And then from that develop your own style.

So, yeah, all those books would have been all good soil from which to grow a distinct voice of your own.

Dwayne: Okay, yeah, what kind of research do you do for your books?

Warren: Oh, lots and lots and lots of research. As soon as I knew I was going to write this book in a modern setting, it was obviously important to get state-of-the-art science, right?

And it's a big challenge because you're developing an entire ecosystem. Not from whole cloth, but one that doesn't exist.

And so, I immediately started plunging into research. I researched in books and on the internet. The Internet has an amazing amount of resources. If you're digging into a highly specialized science, you can find papers on any particular kind of question you might have. And I've just reached out to experts in the field.

I would reach out to experts and find out, you know, get some of their “off the top of their head” answers and then further pursue that with more research.

Luckily, I had been also researching biology for all my life. It was a real favourite pastime. So, yeah, there was a ton of research that went into it.

And then I also ran it past these experts, to see their objections and adjust things accordingly. So, then it would sound and be something that would pass muster and would be enjoyable for actual scientists to read.

And indeed, that's how it's turned out. The book is used to teach biology in Spain. Various courses in American colleges use it. The amount of research has been appreciated in the scientific community.

Even though, of course, it's obviously a book that's fun and requires a lot of suspension of disbelief, it is credible enough for them to take the roller coaster ride and have fun.

Dwayne: In your own words and on your blog, we can see this: **“**Since *Fragment* came out, a number of other isolated ecosystems have been discovered as well, each one astonishing scientists with the variety of their unprecedented plants and animals.”

Would you like to tell us about some of these amazing discoveries?

Warren: Yeah there are some other really fun ones to investigate. Of course, the Movil cave in Romania was a big inspiration for Fragment and would end up being an even bigger inspiration for Pandemonium.

The story of the Bosavi Crater in Papa New Guinea came out after Fragment but is almost like the same story.

And the deep ecosystems around Antarctica have revealed hundreds of new species. The subterranean lake in Antarctica, Lake Vostok was a much-anticipated discovery. People finally drilled through the ice and got to see the species that had been isolated in that lake for a very long time.

Lake Baikal near the Ural Mountains is the largest body of fresh water on earth. And it has an amazingly diverse ecosystem of species that you won't find anywhere else. And even freshwater coral. It is an amazing place.

And then you have sealed caves like the Sequoia National Park. They have species that are unique to only one room in the cave and things like that.

So, all islands that have been isolated for a long period have very specialized, unique species like the Seychelles, or Papua New Guinea or New Zealand and Australia. And of course, Madagascar.

Even Hawaii, it's only been isolated for only existed for five million years. But there is a whole plethora of bird species that they have nowhere else. As well as plant species.

So, yes, there are those. And many, many, many more. And mostly you would find that it is isolated systems that are going to yield the most unique ecosystems. And they would be lakes, underground caves, islands, things like that. That's where you'll find them.

Dwayne: Okay, you have a Patreon account where our listeners can go to support your work. Time to plug your Patreon!

Warren: Yes, yes, very, very much. Appreciate it. Yes.

Publishing doesn't always help you financially, kids. Sometimes you end up worse off having published a book than you were before.

But, yes, contributing a bit to my Patreon account helps me continue to write. And that is Warren Fahy at Patreon.

And I have a PayPal account. Generous fans can help me keep body and soul together by visiting and contributing, throwing a few pence into the hat as it were.

And they're located at my website, which is Warren Fahy dot com. And yeah, very good. Thank you for asking.

Dwayne: Right, that's great. Make note people and go and check all that out and maybe make a contribution!

And now a couple of reader questions. First:

Where do you get the ideas for these amazing creatures in your books?

Warren: Yeah, well, I started with the starting point of saying, okay, what I'm going to do is try to come up with the most alien kind of behaviours. Especially a different form of locomotion from every anything else that you've ever seen.

So, as soon as you look at these creatures, you're like, oh my god, this is not something that we've ever encountered before. And so, that way I just looked and said, it is not going to run like a dinosaur. It is not going to act like a mammal. It is not going to act like molluscs that we know of. It is going to have a completely new and different combination of behaviours.

And so, starting from going from right angles to everything that existed already. And then saying okay, how can we evolve to get to that, this far-out thing that we've never seen before. How can we fill in the dots between what we do know and this crazy thing that we've never imagined?

So that was a good way to design them, to design them at right angles to everything we already know. That's essentially what I did. And of course, make them real scary right?

Dwayne: For sure. All right, next question. Where are you keeping Hender?

Warren: Well, that is well that's somewhat of a secret. Of course, he loves the island of Hawaii. So, he is somewhere on that island. That's as much as I can say. That's as much as I'm at liberty to say.

Dwayne: That was the last question I typed up here. Well, that was great, thank you! Was there anything else you wanted to comment on?

Warren: No, it's just it's been a lot of fun and a lot of fun talking, Dwayne. And going through all this background for my books.

And I would just say that if people are interested in this in science and archaeology and these, these topics and want to see some new theories and ideas about them, I would highly recommend that they read these books.

That they pick them up and read Fragment and Pandemonium and see for themselves what they think.

Dwayne: Yes. I have read them both, of course, and they are highly enjoyable.

Warren: Well, thank you so much. It's been very enjoyable.

Dwayne: I have really enjoyed talking about all of this stuff with you. Maybe we could do this again sometime. Yeah, that would be fun.

Warren: But that would be a lot of fun. And as I'm doing research into what I consider to be the most mysterious group of living things on Earth, the fungi.

As I get into more of the research and the writing, it'll be interesting to see some of the research going on there, right?

Dwayne: Yeah. I don't know so much about fungi, not yet. But cephalopods and monotremes are among my favourites, personally.

Warren: Oh, monotremes absolutely, wow. I mean, that's just it. It's so great to find these sorts of interstitial species that hail from isolated ecosystems like Australia. Yeah, fascinating stuff.

And almost every week, I keep discovering another group of animals that is my favourite obsession of the day. And there are just so many that it is hard to just rattle them off the top of my head which ones are most interesting to me. But definitely monotremes and arthropods.

And ediacara are something that are just mysteries that I am constantly coming back to. Because the most some of the most mysterious fossils

discovered from time to time are from the Ediacaran period before the Cambrian Explosion. And the theories keep going back and forth about where they came from.

There was some particular region in the middle of the desert of South Africa where they found a canyon and fossils that were embedded in this canyon. They seemed to be tiny little toadstools or flower-like fossils. And they're from the Ediacaran era.

They have absolutely no idea what they are. Are they fungi or are they plants or they animals? They have no clue what they were, but there was a whole sort of forest of them. So that was just recently discovered, and they don't know what the hell they're looking at.

That is most intriguing to me because it's completely impenetrable at this point in time. But hopefully, they'll continue to discover more sites of that most extraordinarily rare epoch of life on Earth.

Dwayne: Okay, so what are some of your favourite cephalopods?

Warren: Oh well, probably the one that inspired the ghost octopus in Pandemonium the most would be the mimic octopus.

The mimic octopus can mimic at least fifteen different species. It can swim through the water looking just like a lionfish. It can extend its tentacles to look like a snake and it and it goes on and on.

They can look like mantis shrimp but they bury themselves and they squeeze the shape of their head to look just like a mantis shrimp. So, they disguise themselves as one thing after another.

And not only that, but they dropped a jar with a handle down into the water where many mimic octopuses lived. And they started mimicking those jars.

So, it's not like they are just driven by instinct. They can see something and then duplicate what they're looking at.

So that species can even locomote like different species. And this makes it funny. Only one other animal on planet Earth can do that and that's us.

We can fly we can scuba dive, we can hang glide, we can bicycle we can walk, we can walk on our hands, no other animal does this. They all have a way of locomoting and that's the way they do it. Antelope don't

suddenly start walking on their front paws. They always locomote in a certain way.

Well, these mimic octopus can literally walk. They can clump their eight tentacles into four like legs and then walk along the bottom as though they were quadrupeds.

They can swim like fish; they can wriggle like snakes. So, they are changing the way they locomote in the ocean and that is by far the most fascinating cephalopod I know of.

Except of course, for the ghost octopus, which I invented so yeah.

What is your favourite?

Dwayne: Well, as for my favourite, I am still deciding. I think I might have to go with the mimic octopus, that one is amazing.

Well, I think here would be a pretty good place to wrap up. Thank you very much, Warren! I think we covered quite a lot of ground!

Warren: Well very good. Okay, thank you, Dwayne, bye.

Dwayne: Alright, that is all we have for today. Warren, thanks again for your wonderful, fascinating and in-depth answers.

Very thought-provoking and educational stuff there. And if this does not make anyone want to read your books, then I don't know what will! Maybe a movie or something, but that does not teach you all this extra stuff you covered here, so maybe not?

Yeah, thanks again Warren. Let's hope we have you on again when the next book in the Fragment trilogy, Symbiont, comes out.

Alright, thanks for listening. Until next episode… stay rational.