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*“Suzdal remained calm. He coded the genetic cats. He loaded them into life bombs. He adjusted the controls of the chronopathic machine **illegally**, so that instead of reaching one second for a ship of 80,000 tons, they reached two million years for a load of less than four kilos. He flung the cats into the nameless moon of Archosia.*

*And he flung them back in time.*

*And he knew he did not have to wait.*

*He didn't.*

*The cats came. Their ships glittered in the naked sky above Archosia. Their little combat craft attacked. The cats who had not existed a moment before, but who had then had two million years to follow a destiny printed right into their brains, printed down their spinal cords, etched in the chemistry of their bodies and personalities. The cats had turned into people of a kind, with speech, intelligence, hope and a mission. Their mission was to attach themselves to Suzdal, to rescue him, to obey him, and to damage Arachosia.*

*The cat ships screamed their battle warnings.*

*‘This is the day of the year of the promised age. And now come cats!’*

*The Arachosians had waited for battle for 4,000 years and now they got it. The cats attacked them. Two of the cat craft recognized Suzdal and the cats reported.”*

*– Cordwainer Smith, “The Crime and Glory of Commander Suzdal” (1964)*

**New Crimes:** Technology often creates new crimes (or really old crimes with new means); technology changes, humans don't. Before the dark web and massive theft of credit card numbers and personal information was the thing, I worked on civil prosecution of “satellite broadcast piracy” cases (what we called them). Similar to the illegal cable television boxes (there were billboards then picturing illegal cable boxes being sold from the trunk of a car), “satellite broadcast piracy” involved circumventing the conditional access controls on early individual receiver units (using emulators, glitchers, dead processor boot boards and unloopers), often using a PC, to get free pay-per-view and extra channels. But instead of selling them from the trunk of a car, these were sold over the internet, via credit card payment or COD and shipped through UPS.

And there were forums such as Pirate Den<sup>1</sup> and DSS Nation where people openly posted and exchanged information on how to steal satellite programming and later, there were hack legal websites that advised how to defend against lawsuits brought by the satellite cable providers! Eventually this process was defeated through various technological measures (e.g., Black Sunday) and improvements, and by a national and international legal effort (e.g., the Canadian Royal Mounted Police seizure of the Pirate Den servers and U.S. Marshals seizure of warehouses and servers by court-issued Writs of Seizure).

**Dr. Watchstop:** Doctor who??? It may be commonly assumed that the 4<sup>th</sup> Era of technology would result in the ability to travel time backwards and forwards. Assuredly, however, this assumption must be based on an erroneous pre-1<sup>st</sup> Era understanding of the universe.

- ✓ **Klaxor:** ... The lost phasinator has been activated near the edge of the spiral galaxy. It's still in input mode. **Alien Elder:** Thank goodness! Well, take it offline and roll back the local effect five minutes. We can't have the simple beings mucking up the time continuum, now can we? [The story ends by cycling back to the first panel.] – Epic Illustrated #34, Dr. Watchstop, “Wasting Time,” February 1986.

- Crossing the Rubicon: Is time relative or objective? Suppose you set your time machine to travel back to January 49 B.C. in northern Italy. And when you arrived, you discovered it was mid-autumn and the farmers were harvesting their crops? Because January 49 B.C., when Julius Caesar crossed the Rubicon River with his legions and became an outlaw was mid-autumn because the Roman calendar was out of step with the seasons due to political abuse by the Pontiffs who were in charge of determining when intercalary months were added to the calendar – originally intended to keep the calendar in synch with the seasons, they were usually added or withheld for political purposes. Such was the situation that Julius Caesar’s third year of consulship was 446 days coinciding with his calendar reform to bring the calendars back into synch with the seasons (and also quite politically convenient for him).

✓ The Romans *didn't know* it was 49 B.C. – *human* calendars are political, subjective.

Most science-fiction stories, especially the cheesy kind produced for television (e.g., *The Time Tunnel* (1964)), tends to just ignore the problem (along with language, culture, causality, history, etc.) and vaguely assumes that time is objective, a matter of simply counting numbers backwards from our presumably correct current date (this would even be problematic as to Greek and Roman dates). But in this example, the time machine somehow ‘knows’ or senses the consciousness of the Roman population and goes to the date as the Romans knew it and not simply counting backwards the days from our time.

- Rubicon the Crossing: Would you, if given the chance, want to travel forward in time? It is usually presented as a given, usually as a necessary plot choice of adventure films, that everyone would like to see the future, beyond the end of their expected lifetime. But I don’t know, I have reservations. Science-fiction imagination has presented many grim futures, and not all of them implausible and many of them increasingly plausible from our current view. It is equally possible, a coin flip, that any future you might travel to is as grim as it is bright, as blighted as it is blithe, as blithe as it is benevolent. There is a lot we would need to understand before departing, for example, is the many or divergent worlds theory correct? Is time unalterable or paradoxical?

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*“Well, it could be pure coincidence, but Terminus seems to be at the exact centre of the known universe.” – Dr. Who, “Terminus, Part 1” (February, 1983)*

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**Terminus**: Alternatively, there is a theory that the current exponential advance of technology cannot go on indefinitely; that at some point, we would completely understand the nature of the universe, that technology would reach a state of engineering perfection, and that civilization would catch up with its technology and culture and technology would co-exist comfortably for eons until we got tired, or we or the universe changed, or we went onto something else. I don’t know when this point would be reached, any more than I can describe the operation principles of 3<sup>rd</sup> Era technology. However, it may be that there is no 4<sup>th</sup> Era of technology, or that the 4<sup>th</sup> Era is the terminal Era. This is a decision for the participants, as part of the story-arc of the game, participants may decide when or if there is a terminal point to technology in this game, or it may occur that the game simply ends before anyone has to reach that question.

- Ancient Interstellar Cultures: We are in the mental habit of dividing things and ranking them; because culture as a concept existed from ancient times, and technology was the seemingly new phenomena (though it really isn’t), technology was regarded as a separate thing, an

outside force exerting a pushing, guiding, warping effect on culture. Thus, the vision evolved, especially in the 20<sup>th</sup> Century, of a somehow adversarial relationship between culture and technology in civilization, and that technology was advancing much faster than culture could adapt to it (*à la* the Cold War). This worldview is a symptom of the cognitive dissonance of the late 19<sup>th</sup> and early 20<sup>th</sup> Century populations caused by rapid technology.

Probably taking a page from *Dune* (1965) which begins in the year 10,191 A.G. and the first year of their calendar begins around 13,000 A.D. on our calendar,<sup>2</sup> Star Wars' (1977) hyper-space-drive technology appears to be over 25,000 years old and human planetary technological civilization much older.<sup>3</sup> Both *Dune* (1965) and *Star Wars* (1975) represent civilizations that have had galactic interstellar travel for far longer than the commonly known history of human civilization on Earth – where were your ancestors 25,000 years (1,250 generations) ago? Where would you go to visit them if you had a time machine?

Generally *Star Wars* technology appears to have reached near stagnation – or at least advances much more slowly than ours in the latter part of the 20<sup>th</sup> Century – but their culture is far from what anyone would call perfect. *Star Wars* technology has not led to any final galactic utopia, rather, the movies, the entire franchise, is premised on an endless militant space-opera adventure and mythic morality play. In fact, *Star Wars* is a 1960s and 1970s view of our world, tossed into the sky and blown up to epic proportions, as is nearly all space-opera fiction; the flaws of *Star Wars*' galactic civilization, their cognitive dissonance with advanced technology, are the flaws of our world because we can hardly imagine any better of humanity or the universe (echoing Norman Spinrad, Governor Nix in *Tomorrowland* (2015) and maybe a little Pangloss).

**Thumbing Our Nose at Einstein:** Einstein was a good fellow, don't get me wrong, but ... implicit in any sort of faster-than-light travel or transport system (e.g., FTL, Stardrive, Stargate) is likely some sort of temporal technology to abrogate the time-dilation effect of relativistic travel. Arguably, there may be some means of FTL travel – such as taking a 'shortcut' through an alternate universe – that would not necessitate a temporal abrogation. Most players are not likely to envision that a turn represents generations and centuries of real time, so the admission of Stardrive technology necessitates the admission of some level of temporal knowledge/effect (even if as a side effect of Stardrive), which opens the door to temporal technologies in the game.

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*“For example, suppose you traveled into the past and somehow or other prevented your own parents from meeting. Why, then you would probably never have been born which is something of a contradiction, isn't it since you are clearly there.” – Carl Sagan, Cosmos, Episode 8*

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**Drop Ship 242:** The alien troopers readied as their ship prepared to drop out of hyperspace in the target planet's upper atmosphere. It was necessary to blind drop on the Earth due to its legendary defenses, there would be no time for reconnaissance, drop would be made from 100 miles up at full speed.

The troopers boarded their plungers; at 100 miles above the Earth, three dozen enormous saucers appeared and descended long shadows on the major cities of the Earth, each carrying thousands of planet scrubbers, war machines, and a large fighter complement, along with the massive steri-

lizer weapon in the center bottom facing down. To the alien commander's surprise, no Earth defense forces came up to meet them, and no shots from Orbital Bases hit their top shields. The planetary civilization below appeared to be very primitive, having only reached the atomic-electronics stage. Still, they had a job to do and their programming was 'all in for the job.'

Two years later after the invaders were defeated, perhaps by the primitive native forces, perhaps by running out of supplies, perhaps by the industrial pollution in the atmosphere, perhaps by microbes, 11<sup>th</sup> Century Earth inherited their technology which was reverse engineered and the sociopolitical and cultural changes wrought by the invasion hardened the Earth's resolve to go out and conquer the stars, to spread such fear, ruthless destruction and terror that no aliens would ever think of invading the Earth again!

**Classic Paradox:** A classic paradox: If you go back in time to prevent a bad event from happening, and you succeed, then you did not go back in time to prevent a bad event from happening? This instantly unravels 95% of time-travel fiction.

- ✓ The 2016 series *Travelers*, which I have not watched any of, has this very problem from the starting description: If they succeed in preventing the bad future then they did not travel back in time to prevent the bad future. Stop, do not pass GO, do not collect \$200. Go straight to jail.

The science-fiction theme in the *Travelers* series is just a gimmick (a 'tacked on theme'), as is much of television science fiction, very little of it is truly science-fiction literature. A review of the *Travelers* episode summaries shows that the time travel was just a set up for the drama tangle; the episodes summarize who is lying, cheating, backstabbing, blackmailing, or sleeping with whom in each episode. The same plot summary could have been written for any 80s evening soap, *Travelers* is thus an 80s evening soap with time travel and it is not surprising that my friend's wife loved it. *Travelers* was *Quantum Leap* plus *V* plus *Dallas*.

One-way causality is a pain in the nekta, but it is what keeps us sane. Sort of. Less is more, more or less.

- ✓ **Clara:** Time can be rewritten. **Doctor Who:** With precision. With great care. And not today. But you know that of course, otherwise you wouldn't be threatening me... If I change the events that brought you here, you will never come here and ask me to change those events. Paradox loop. The timeline disintegrates. Your timeline. ...  
**Clara:** I have seen you change time, I have seen you break any rule you want. **Dr. Who:** I know when I can, I know when I can't. ... – Dr. Who, "Dark Water" (2014).
- **Ghost in the Daylight:** In *The Time Traveler's Wife* (2009), Henry can never stop his mother from getting into that car (as his father wishes) because that would create a paradox – he survived the car accident when he started time jumping. To go back in time and prevent his mother from getting into the car would mean that he never started time jumping.

At the end of the movie, though, they did allow that he appeared on one of his earlier time jumps in the meadow about five years after he died (sort of 'life after death'), meaning that he travelled forward to a time after his own death (Henry never however, preexists himself, never lands before the first moment he jumped).<sup>4</sup> Yet he seemed to have understood that he died, as Clara was much older and didn't hide her sorrow much, neither did their daughter, Alba. So was it life after death?

Clare completely outwitted Henry in having a daughter, one could think that with all of his time-jumping experience, he would have anticipated that she could be impregnated by an earlier version of himself before he had the vasectomy. This drives home that the point of the movie was the child, Alba, whose name he obtained from meeting her in the future, so she was already named before she had a name; he did not encounter Alba in a time-jump event until Clare was near full term and they were deciding on the child's name.

Suppose they had decided as an act of rebellion to name the child Michelle or Sonja after he met Alba in the future? What would have happened? Would that have meant that he never met her on the time jump? Was it all pre-destiny? He had knowledge, was he unable to make any other choice in the naming of the child? He could have lied to Clare about the name of their child.<sup>5</sup>

At that future point (the end of the movie), he was effectively a ghost in the daylight, which suggests something interesting about ghosts if they exist. There is no indication whether he appeared after that, but one would assume that eventually his appearances in the future would end, as well as his encounters with his time-jumping daughter, unless she is able to fully control where she goes in time.

- ✓ **TV Show Host:** So, are you saying your subjects are people or ghosts? **Dr. Mieselhoff:** Are you saying there's a difference? – from Einstein's God Model (2016).

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*“Surely the inventor of a time machine should have a few screws loose, and the glint in his eye should not be from tears.”*

– Roger Ebert, review of *The Time Machine* (2002), March 8, 2002

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**The Door to That When is Closed:** Unfortunately, this game is designed by and played by pre-interstellar primitives living before the 1<sup>st</sup> Era of interstellar technology (i.e. people who can only see the shadow of a hyperbolic cube), and therefore, is severely limited in its possibilities. Generally speaking, this game (and the Concierge) is not capable of handling the complications, alternate universes, and paradoxes, e.g., grandfather paradox, ontological paradox, causal loop, predestination paradox, quantum headache paradox<sup>6</sup> – I made that last one up, but who's to say I didn't already invent it before I made it up? – that would result from allowing unlimited or largescale temporal technologies. Therefore, any temporal technologies developed in GGDM will be extremely limited (most professional writers and movie directors don't do a good job with temporal technologies either).<sup>7</sup> The Concierge should not allow any sort of temporal technology that causes the game to collapse into cracked causality chaos.

- ✓ For example, the writers of the original Planet of the Apes Movies (1968-1973) were not careful or cared less about continuity. The first sequel, Beneath the Planet of the Apes and featuring the original characters – thus taking place shortly after the end of the first movie – ended with the original human astronaut, Taylor, destroying the world with a doomsday bomb. Thus, humans were what the ape scrolls said they were and that would seem to be the end of it. But to make a third movie, they had to introduce time travel, sending apes from the future back to the past, back to the world and timeline from which Taylor originated.

By the time of the fifth movie, the narrative frame – an orangutan lawgiver is reading scrolls to a mixed audience of ape and *normal* human children – showed a future set centuries after (but millennia before the first and second movies?) the events of the third, fourth and fifth movies that detailed the ape revolt, which seems to directly break with the first and second movies where humans are devolved to wild beasts (required happy ending retcon?). Then in 2011, a new series of Planet of the Apes movies was added, not a reboot of the original movie, but a seeming reboot of the events of the third movie of the original franchise. So, Planet of the Apes taken on the whole has become a confusing mash of sloppy time-travel, social-messaging sci-fi cinema, Hollywood pressures, partial reboots and/or alternate futures.<sup>8</sup>

Some positions in the game may progress into the 4<sup>th</sup> Era, sans any automatic assumption that doing so implies or necessitates temporal traverse technology. The acceptance of temporal technology will depend in large part on the cleverness of the players in designing such technologies; the meaning of such within the game and the current game circumstances, and the record that the players proposing such technologies have established with the Concierge.

- ✓ For example, the Krenim temporal weapon ship (featured in the three-part “Year of Hell” (1997) arc in Star Trek: Voyager) that erased entire homeworlds from history, sending out massive temporal alternate history shock waves, in an attempt to restore the Krenim Imperium, is exactly the kind of causality chaos that GGDM is not suited to handle, but the chronitron torpedoes would likely be workable within the GGDM framework. Predictably, each attempt that was not 100% successful in restoring the original Krenim timeline, required another attempt to fix what went wrong in the previous attempt, *ad infinitum*. Annorax then exhibits mythopoeic thinking in explaining his failure by stating that time itself is retaliating against him, preventing him from success, because of his arrogance in manipulating time (that is, that his failure is a personal decision on the part of *time*). Captain Janeway acts the same way toward her ship. The whole mess collapses when Voyager rams the Krenim temporal weapons ship.<sup>9</sup>
- ✓ In George Oliver Smith’s 1947 better-mousetrap short story, “Rat Race,” a government lab has a problem: It is being overrun by rats and can’t get any rat traps because of wartime production priorities. So they make a better mousetrap: A magnetic field, the mice go through and disappear. Problem solved. You may have guessed by the end, that it was sending them back in time. Back in time to the weeks before when the lab was being overrun by rats. And the rats who went back in time had babies, the same rats could go through the mousetrap many times and have parallel existences, having lots of babies. Until the country is being overrun by rats.
- Un-rung: The core issue for the universe stricken with the causality affliction is that the bell cannot be un-rung. Events that have happened cannot be made to un-happen, the dead victims cannot be brought back to life. We are left then with either various attempts to prevent the bell from being rung, or retribution, punishment, and repair after the bell has sounded.
  - ✓ “We can’t know everything. The crooks always lead the cops, be it in drugs, theft or anything else. All we can do is bring the hammer down on the futures of those who get caught.” – Ken Davidoff, “Astros-Patriots cheating comparison adds layer to MLB’s decision,” New York Post, November 16, 2019.

This is the limitation of our justice system and our medicine and our lives. However, I will concede that causality does create meaning that humans crave; how meaningful would events be if they could be undone? Or if they appeared in any random order?

- ✓ When was the last time something stupid, annoying, petty or just plain wrong spontaneously un-happened? Well? I'm waiting. No, that would be called a miracle, and miracles are about as real and probable as unicorns and Super Man movies.
  - This is a funny sentence: "...that the invention of the causality violation device was the cause." – Dexter Palmer, Version Control (2016).
    - See Alternating History, 6 Government Titles, p. 654, *supra*, for full feature quote.
- Four Floors: When a character travels in time, are they simply going backward or forward to a point in time at the same spatial location on the planet surface – ignoring planetary orbital movement and planetary rotation, otherwise the character might find herself in space without a suit – from where they began? Clearly the character in H.G. Wells' Time Machine (1895) simply went forward in time without moving spatially (and didn't end up in space without a suit), and doesn't travel far from the location of the time machine, but has to retrieve it from the Morlocks who hid the time machine a short distance away. Roger Ebert noticed it too:
  - ✓ "The time machine has an uncanny ability to move in perfect synchronization with the Earth, so that it always lands in the same geographical spot, despite the fact that in the future large chunks of the moon (or all of it, according to the future race of Eloi) have fallen to the Earth, which should have had some effect on the orbit. Since it would be inconvenient if a time machine materialized miles in the air or deep underground, this is just as well." – Roger Ebert, review of The Time Machine (2002), March 8, 2002.

On the other end of the British spectrum is the Time and Relative Dimensions in Space – Dr. Who's TARDIS which goes pretty much anywhere and anywhen in this universe and a few other universes. Most other time-travel fiction, from the awful Time Tunnel series (1966-1967) to the edgy, hard-bitten 12 Monkeys movie (1995) are careless or indifferent as to movement in spatial coordinates when travelling in time – James Cole, on his first trip back in time from Philadelphia in 2035, lands naked on the Western Front during WWI (and not in space without a suit)!<sup>10</sup>
- Landing Nude: Interesting aspect of the Time Machine story is that he did not travel backwards in time from his starting point, but did travel back to his starting point from the future. H.G. Wells certainly had an interest in history so it is possible that this was a public relations consideration; to have traveled backwards in time (800,000 years) as far as he did forwards in time would have offended the commonly-held (but crumbling) Christian-calculated biblical age of the universe (or at least the Earth, which was the same back then) since creation.
  - ✓ Henry in The Time Traveler's Wife always lands nude in the past or future, like James Cole on the Western Front in WWI, but has no spatial difficulties, in fact, he frequently lands in 'the meadow' behind Clare's parent's house (where she plays as a little girl, *ahem*) as if that place were spatially fixed in another dimension. And the family never moves away.



- ✓ Incidentally, if little Clare happened to see him nude – is he a pervert? He certainly would have been arrested if the cops found him nude. The story skirts the issue because she is his future wife and the mother of his time-travelling daughter. She had sex with him when she was 17, then he stopped appearing in the meadow and they didn't meet until almost ten years later, and he didn't know her, so his jumps back to the meadow...
  - ... well, it's probably like Dr. Who and Riversong.

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*“The paradoxes resolve themselves, by and large.” – Dr. Who, “Hide” (2013)*

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**Taming Tea-sipping Time Travelers:** Some argument was made that with this carefree statement, the series violated its own carefully established rules of writing to avoid paradoxes.

Paradox resolution is not always a nice clean process though! One of the most clever creatures in Dr. Who universe were the Reapers (before the Weeping Angels), temporal predators who swarm like bacteria to the wound in time created by the temporal paradox (“Father’s Day” episode, I particularly noted when the Doctor said this wouldn’t have happened if the Time Lords were still around...). If participants in GGDM decide to play around with time, these guys just might appear! The only safe place is an old building; the older an object is, the more difficult it is for them to pass through it (because of its Temporal Constructural Element ☺).

In the 2014 “Dark Water” episode, they modified the narrative a bit to make less contradictory rules about paradoxes in Dr. Who ... like a News Event in GGDM ...: Now time can be rewritten with great care and precision, even if it causes an obvious great paradox, and he knows when he can and when he can’t! Except that the writers stop short of just saying he can rewrite paradoxes. Moving on to Looper (2012)...

- ✓ “To bring this back to Looper, it seems as if the depiction of time travel in this film is somewhere between Leibniz’s model of God, and some of what was just described in regard to quantum phenomenon, in a way which is more fuzzy than Leibniz imagined, but more like that of quantum physics. *For rather than a God which strives to produce the ‘best possible’ universe, it seems like that Looper aims at something much more realistic, at least in terms of quantum physics, namely, a universe which aims to produce the most consistent possible version of itself, as manifested by a pull of sorts towards consistency.*” – Christopher Vitale, “Collapsing the Fuzzy Wave: Rian Johnson’s ‘Looper’ (2012), Quantum Logics, and the Structures of Time Travel Films,” networkologies (blog), written in 2012, updated and reposted, October 31, 2014 (emphasis added).

Conversely, author Julian May carefully limited the spatial and temporal range of time travel to one point in the Earth’s past, *Pliocene* France, just where the alien Tau and Firvulag had settled.

- ✓ “While the discovery of time travel is a great scientific achievement, its practical application is limited. After the initial discovery, it is soon found that due to its very specific geographic and other requirements, the time gate only works in one location and one point in time in the past. The device can be used to transport people, animals, and objects back in time to the Pliocene era intact, but any attempt to travel forward in time from the Pliocene by the same method ages the traveler or object by six

millions years instantaneously. This effectively makes the portal a one-way trip for any living being, and other organic objects. This limitation also made communication from the time-travelers almost impossible, making it a blind one-way trip.

After the death of the inventor, his widow finds herself inundated with a steady stream of late 21<sup>st</sup> and early 22<sup>nd</sup> century misfits/outcasts begging to be allowed to escape the modern world for a chance to start over in the simplicity of the Pliocene. The widow finally gives in and eventually establishes a regular training program for the ‘groups’ making the trip back in time to ensure they have the basics for survival and a trade in the Pliocene era. To prevent any contamination of the past, the Galactic Milieu sterilises all females by salpingectomy before allowing them to go back to the past and does not allow any advanced technology that will not decompose after around a hundred years to be taken. The Milieu also does not allow any operant meta-psychics to go back to the Pliocene.” – from Wikipedia article, “Saga of Pliocene Exile,” (early 1980s series by Julian May), captured October 29, 2018.<sup>11</sup>

It is as if to suggest a divine plan (i.e. the author’s ☺) is in play allowing these two times to narrowly connect while avoiding temporal paradoxes.

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*“The fundamental difference between the attitudes of modern and ancient man as regards the surrounding world is this: for modern, scientific man the phenomenal world is primarily an ‘It’; for ancient – and also for primitive – man it is a ‘Thou’” – Henri Frankfort, 1946*

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*“Any phenomenon can surely be experienced as both an It and a Thou: consider, for example, a pet and a patient.” – Robert Segal, 1977*

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**More than a Feeling (can you hear it?):** Despite what Hollywood movies show, travelling back to visit a historical era would not likely be much use, for example, speaking to someone from Elizabethan England, even an educated person from that period, would be like speaking to a nine-year-old version of yourself.<sup>12</sup>

I have given considerable thought to how my life might be changed if I travelled back in time. I have come to the conclusion that if I did it all again, I wouldn’t do any better than I did the first time, despite my knowledge of the probable outcome. I don’t have the level of intellect and wisdom to make it ‘come out right.’ If I changed the bad things that happened, other bad things would have happened. There are too many variables and branches for my SQ. Likely, the outcomes would be worse.<sup>13</sup>

- ✓ You are here reading this now. If you could repudiate history, would you go back in time and prevent the invention of gunpowder, would you destroy the draft of Novum Organum (1620), would you prevent either Genghis or Kublai Khan from being born, would you make Buddha a king instead of a sadhu, would you prevent Christ from being crucified or have him crucified upsidedown, would you have Christopher Columbus committed to an insane asylum in 1490? Would you kill Hitler as a baby? Suppose there were a point in history where a race could decide its own history?

For much of my life, I have had a vague but persistent intuition of a parallel between intellectual, cultural, political, and religious development of human civilization globally, and the cognitive developmental stages through which we all pass as children to adolescence and adulthood.<sup>14</sup> For example, “mythopoeic thought” of ancient human civilizations, described by Henri Frankfort, seems to correspond roughly with Jean Piaget’s preoperational stage of cognitive development. This mythopoeic condition existed despite the fact that the majority of the population – as is common in any human population – *was adult*. That is, *adults had mythopoeic thinking as their worldview*, it was not a trivial thing, and it should not be trivialized. Overall, this suggests to me that the general level of abstract thinking that exists in the current population has not always existed (though there were always stand-out groups or individuals who were ‘ahead of the curve’ in their time); others would point to the late advent of empiricism in humanity.

- ✓ When you live with and adore cats and they adore you back, you learn the intelligence and personality of each cat. Many times, they remind us of small children – forever infants they are to us as Roger Caras wrote in 1989 – yet at the same time, they are the *viable adults* of their species capable of survival, fighting for mates and territories, and raising young. With only a couple of ticks difference in SQ and neural mass, we may appear the same to alien intelligences; our lives a brief flicker, our games and machines like cat toys, our attention spans short, our dramas silly play.
- ✓ This long-unspoken dichotomy of adult human populations and the infancy of human civilizations is at the core of nearly every debate about humanity, as it is at the core of our relationship with our pets, and our imagined relationship with a supreme being or creator (in the current version). It is also probably the core problem of any macro-view of humanity, e.g., macro-history and macrosociology.

How old are we now?<sup>15</sup> Development of realism, a cornerstone of modernity, as opposed to medieval and Aristotelian idealism, wishful thinking or magical thinking, seems to correspond to an operational stage of human development. However, attempts to form concrete ideas of this fuzzy parallelism are comparable to the alleged synchronicity of The Wizard of Oz and the Pink Floyd’s Dark Side of the Moon album.

- ✓ Even if I am completely, dead, demonstratively wrong, it’s not a bad image. It offers some larger framework for the lurches, stops and mental chaos of human history, within a very human frame of reference instead of some distant, murky deity or esoteric concepts.
  - ✓ If I am correct in this feeling, however, it provides an inevitable – an 8-year old human cannot refuse to grow up (unless your name is Peter Pan) – but very hazy direction, with no predictive value on how it might play out, to the future development of humanity, barring some enormous disaster.
- **Mythopoeic Thinking:** Mythopoeic means “myth-making” so that mythopoeic thought is a cultural intellectual habit and worldview where myths are constructed to explain observed events, origins, and behaviors.
- ✓ Dr. Stephen Griffith, Lycoming College, during a lecture in Philosophy of the Occult class, offered perhaps an explanation for the beginning of Abrahamic religion, from a mythopoeic perspective of ancient humanity. To the tribesman there were three objects (three is a common special number in the ancient world), the Earth where we stood, the Sun and the Moon that moved across the sky. And so the Sun rose every

day and provided warmth and light, and the Sun went away, and the Moon rose, providing night illumination and a steady progression, and the seasons marched by in order. And that was their world. But on certain occasions, during the day, something big would make the sun go away (i.e. a solar eclipse) and the world would grow dark. So there was a fourth thing out there, something that was more powerful than the Sun – casting aside our modern understanding of orbital mechanics – there was some invisible being that could make the Sun go away. This thing was more powerful than the Sun god and they were very afraid.

- ✓ Carl Sagan cleverly explained in *Cosmos*, Episode 7, that Paleolithic ancients may have thought the stars were the distant campfires of great tribes in the night sky who should be venerated and appeased lest they come down and kick our asses.
  - “One night I thought the stars are flames. They give a little light at night as fire does. Maybe the stars are campfires, which other wanderers light at night. The stars give a much smaller light than campfires, so they must be very far away. I wonder if our campfires look like stars to the people in the sky. But why don’t those campfires and the wanderers who made them fall down at our feet? Why don’t strange tribes drop from the sky? Those beings in the sky must have great powers. I don’t suppose that every hunter-gatherer had such thoughts about the stars. But we know from contemporary hunter-gatherer communities that very imaginative ideas arise.” *Id.*
- ✓ Both Columbus and Tecumseh and his brother used Western knowledge of astronomy to correctly predict the exact timing of local solar eclipses which gave them divine power over frightened mythopoeic tribesmen.

In all myths, the world is personified by human-like gods, spirits, and sapient natural forces, such that each natural event represents a personal choice on the part of a god, spirit or sapient natural force. Mythopoeic thought remains infused into our daily language; it is the origin of anthropomorphic references in our language, for example, ‘it looks like it **wants** to fall over,’ or ‘the wind is **trying** to pick up’ or ‘**she’s** solid steel’ referring to a machine and not a female bodybuilder. We can hardly say anything without an implied anthropomorphic (and even divine) reference, for example, ‘tasks waiting to be done’ implies patience on the part of the tasks; though the term is capable of being used neutrally, it is usually not taken so. Similarly, when something ‘provides an example,’ even though that something is not a person who is intending to do so, it is difficult to mentally separate ‘provides’ from perhaps divine or parental beneficence.

- ✓ In the crowd-funded movie *Fifth Passenger* (2018), the doctor, the navigation officer, and the agricultural technician were discussing the catastrophic environmental events on Earth. The doctor refers to “Mother nature” and the navigator refers to Earth as “her.” The agricultural technician ends saying, “About the only thing we do agree on for sure is that the planet is a woman.”

This is different from modern thought where events and behaviors are all tied to an underlying set of neutral natural laws, forming a consistent pattern, so that we look to formulate laws and math expressions, and to test and adjust them until they predict correct results. It might be argued then, in a very careful and circumspect way, that modern minds display greater abstract intelligence than ancients (however, I still display mythopoeic traits in my absurdism).

Whether this change is a result of cultural intellectual development or whether it is a result of some physiological change in the human brain (e.g., Julian Jaynes' bicameralism) is still debatable – but in evolutionary terms, the odds of a wholesale physiological change in the human brain through the population in just the 2000 years from classical antiquity, is very remote, *but not impossible*.

Viewed in these terms, e.g., Henri Frankfort, *ut supra*, creation science, intelligent design, and theistic evolution are in succession the last bastions of mythopoeic thinking in the West. After the Fundamentalist had screamed themselves into hoarse absurdity in the 1980s (I was there), intelligent design advocates attempted a more nuanced approach (something less than a sledgehammer to crack a walnut), and failed in 2005.

- ✓ “By the mid-1990s, intelligent design had become a separate movement. The creation science movement is distinguished from the intelligent design movement, or neo-creationism, because most advocates of creation science accept scripture as a literal and inerrant historical account, and their primary goal is to corroborate the scriptural account through the use of science. In contrast, as a matter of principle, neo-creationism eschews references to scripture altogether in its polemics and stated goals (see Wedge strategy). By so doing, intelligent design proponents have attempted to succeed where creation science has failed in securing a place in public school science curricula.

Carefully avoiding any reference to the identity of the intelligent designer as God in their public arguments, intelligent design proponents sought to reintroduce the creationist ideas into science classrooms while sidestepping the First Amendment's prohibition against religious infringement. However, the intelligent design curriculum was struck down as a violation of the Establishment Clause in *Kitzmiller v. Dover Area School District*, the judge in the case ruling “that ID is nothing less than the progeny of creationism.” – from Wikipedia article, “Creation Science,” February 5, 2019.

Their last trenchline is theistic evolution which tries to be unobtrusive and inoffensive so that no one notices.

- ✓ See Dating Man discussion, 5 Beginnings, p. 57, *supra*.
- The Fine Print –Isms: Parallelism used here (not to be confused with the theory of the mind concept, psychophysical parallelism) is a fuzzy concept, it is an analogy that works and has intellectual and cognitive value if it is not pushed to definition, details and precision.

Parallelism should not be construed as an absolution of humanity for all of the egregious past wrongs inflicted and committed by every culture, in every time, across all of the regions of the globe. Parallelism is not a moral judgment; it is not to say that all of the things humans did in the past are forgiven as we forgive children for their transgressions due to immature judgment – I am not the Christian God. It is the same as the dichotomy of cats: Though our species was childlike in a mythopoeic sense, the population was made of adults capable of individual reasoning, reproducing, childrearing, and all the things that eventually led to our civilization now (see related discussions in 4 and 5 Taxation & Census generally, *supra*). Rather, parallelism is simply an intuition, perhaps an observation that is pre-theoretical:

- ✓ “The pre-theoretical intuitions are decidedly strong and clear. What is unclear is how the pre-theoretical intuitions are to be accommodated theoretically within the favored

analysis, and it is this that leads reductionist to contend that the intuitions are inconsequential. At the very least, the anti-reductionist is owed an account of why the intuitions arise if they are not accurate.” – John W. Carroll, “Anti-reductionism,” The Oxford Handbook on Causation (Ch. 13, p. 292), Ed. by Helen Beebe; Christopher Hitchcock; Peter Menzies (2009)(text found on Google Books).

*Realism* is used here in the sense of Merriam-Webster online dictionary, **1**: concern for fact or reality and rejection of the impractical and visionary and **3**: the theory or practice of fidelity in art and literature to nature or to real life and to accurate representation without idealization. GGDM is a thorough work of modernity as it somewhat militantly emphasizes profound realism – as much as can be had in a science-fiction or space-opera setting – as the best and base means of understanding and rarely discusses what might be ideal.

- ✓ Contrary to some arguments, realism does not entirely displace idealism, and they are not exactly as opposite as they seem; rather, they exist side by side in some kind of relationship within our modernity. If you are trying to tell me you have a solution to a social problem, I will inquire about what you believe is the ideal condition to be reached by the solution and on what ideological, religious, intellectual or philosophical theory it is based. After that, I probably won't agree with you or be entirely convinced, but may be thankful for a good discussion.

I would argue that GGDM is more a *post-realism* than realism work. Post-realism occurs when our society realized that reality is not quite what we thought it was; when cracks develop in the concrete floor (upon which the psychology of realism depends) due to the propagation of quantum physics, sub-atomic physics in general, computer animations and virtual realities, advanced filmmaking techniques and special effects, science-fiction imagination becoming science fact, the systemization of public relations, propaganda, and now, social networks, sophisticated foreign trolling, and as Rand Corporation authors put it, “Truth Decay.” We are not yet willing to abandon the building as haunted, but we are not quite as sure of what is real as we once were, and reality has become incredibly complicated, losing much of its initial-seeming clarity, practicality, charm.

- Putting Away Childish Things: “When I was a child, I spake as a child, I understood as a child, I thought as a child: but when I became a man, I put away childish things.” – 1 Corinthians 13:11 (King James Bible).

That I comment throughout GGDM about the Existential Void and Absurdism (and make absurdist points), might lead some to believe that I am pessimistic, nihilistic, and perhaps in need of psychiatric evaluation. They might also, by extension, conclude that reading GGDM is not good for youthful minds. All of the preceding (except possibly the need for a psychiatric evaluation☺) is the opposite of what I consider to be true about GGDM, the opposite of my intent in GGDM. Consistent with my sense of parallelism discussed here, much, if not all, of GGDM is about humanity putting away childish things. So is physical science and empiricism, but in a different way. You can handle it or you wouldn't be this far into the text of GGDM; GGDM is perfect reading for youthful minds, as it is they, not us, who will put away childish things.

- ✓ “I have been thinking about what Christ will mean in the future. We'll need a new form of Christianity in a time when the world has come of age. I think there is only one purpose of religion in the modern world where people must come and share each

other's suffering and share the suffering of God in a godless world. We'll need more than just religion in the former sense. We need faith and Jesus Christ as its center. Real Christianity means sharing each other's pain. It is not for us to prophesy a day when men will once more ask God that the world be changed and renewed. But when that day arrives, there will be a new language, perhaps quite non-religious, but liberating and redeeming as was Jesus' language. It'll shock people. It'll shock them by its power. It'll be the language of a new truth proclaiming God's peace with men." – Dietrich Bonhoeffer's swan song speech in *Bonhoeffer: Agent of Grace* (2000).

But I am not going to turn any pages in history here, with GGDM. Humanity is notoriously slow to understand. Change does not occur unless there are consequences. There are three freight trains coming down the track we are standing on (see *Standing on the Tracks*, 3 Entropy, p. 244, *supra*).

- ✓ GGDM is – if I may flatter myself for a moment – a college course in a simulation game. It is as much a treatment of its chosen subjects as a serious book of equal length. In this, it is no different than *Cosmos*, either the book or the television series, episodes of the latter I have viewed in high school and college courses. And I suppose that there is little difference of intent between Carl Sagan and I in our chosen creative projects.
- Still Gorgias: It is possible that recorded historical experience, education and empiricism have somewhat answered Plato's objections to rhetoric in Gorgias (380 B.C.). It seems likely that in mythopoeic culture, people were more likely to believe things simply because they were said, since their entire world was formed in story. Mythic history instead of empirical history, mythopoeic explanations instead of natural observation, etc. This probably extended also into the realm of politics and human affairs. Fame and sociopolitical position (e.g., *arête*, *gravitas*) of the speaker and subject enhanced this effect.

If in fact people are now less likely to believe what they are told, if they are more likely to think critically or seek other evidence and opinion – then they may be less able to be influenced, misled or to have false knowledge created by a sophistic speaker. But this also has a side effect weighing against it, in that it engenders cynicism, suspicion, and hampers communication and understanding. The last historical example of the stark Platonic disaster was Nazi Germany and certainly the world hoped that time had passed. However, this must remain just a theory for now, as the hysterical (and not very funny) rhetorical disaster that was 2015-2017 (and which no media fact checking and levelheaded criticism could derail) set us back decades and remains the relevant evidence at this moment against my hypothesis.

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*"It is all a matter of time scale. An event that would be unthinkable in a hundred years may be inevitable in a hundred million."*

– Carl Sagan, Cosmos (1980), p. 73

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**Tribal Minds**: Even the scale and complexity of human history has become incomprehensible in the view of the average human; our personal scale of history rarely extends farther back than the stories we hear from the youth of our grandparents.

I was surprised and delighted as a teen when I met a WWI vet; he and his wife were approaching 90 years old and I delivered their newspaper in the early 1980s, they were both born within a half-decade of Katherine Anne Porter who died in 1980 at age 90 (I vaguely recall they said they were born in 1894 and 1896, which was a year that didn't have a '19' in front of it... all birthdates I knew started with '19').

Thus, when combined with the human concept of forever in *A Dying Age*, 2 Eras, p. 774, *supra*, the personal human time scale of history extends from approximately our grandparent's youth to our grandchildren's children. See also human time scale discussion in *A Story Without Characters* and *A Story in Unreal Time Scale*, 4 The Streams of Time, both p. 102, *supra*.

- ✓ “Ultimately, I have no illusions that I will last beyond the minds of a couple of generations after me, at best.” – Narrator, “Eventually, Everyone We Know Now Won't Be Known By Anyone,” Pursuit of Wonder YouTube Channel, March 4, 2020.

And of the cities of humanity we may encounter, research shows that at any given moment, we retain memory of about 150 people, according to Prof. Robin Dunbar, researcher in evolutionary psychology at Oxford University, which is approximately the size of a clan in hunter-gatherer societies (or a later modest village), and below the level of a tribe. See, Mona Chalabi, “How Many People Can You Remember?” September 23, 2015, FiveThirtyEight.com.

- ✓ It is also possibly why the most basic unit of military maneuver is the company of 100 to 150 soldiers, the military company-sized unit is the most basic level of true unit cohering/cohesion (e.g., the Roman Cohort of 120 men), while larger units, battalions and regiments, mirror approximately the size and cohesion of a tribe as described by Prof. Dunbar, about 500 to 2500 people (or later a town). *Id.* Human military units developed psychologically along clan and tribal lines.

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*“One small step for Russia, one giant leap for Communism.”*

– Yuri Gagarin, Cosmonaut, First Man on the Moon (from *The History of Time Travel* (mockumentary, 2014))

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**Temporal Patents:** The successful prosecution of the Temporal Patent does not depend on any die rolls or Matrix criteria, rather, successful prosecution is solely and arbitrarily at the discretion of the Concierge. In regards to Temporal Patents, the Concierge will err on the side of ultra-cautious preservation of the orderly play of the game without undue delays. The form of the Temporal Patent is not set, however, when submitted to the Concierge, it must contain a careful and detailed description of the game operation of the proposed temporal technology and especially, limitations of the technology and any anticipated problems that might arise during game play of the technology.

- ✓ Thus the Concierge becomes that mythic entity *time itself*, and whether the temporal technology succeeds or not is a personal decision. Role-playing games and fiction writing have strong mythopoeic elements; any game (or creative process) where the game master (or writer), representing the *mythic* universe, has a final say in the game (or work), instead of die roll results as in a straight board game, makes the game master the mythic personification of the universe and any sub-entities, the actions of the game universe are then the personal decisions of the game master (or writer).



*“Time travel? Well, all right, let’s play both sides of the street on this one. Supposing general relativity is in fact right, and we all live on the surface of a hypersphere. If you make the slight additional assumption that the hypersphere is rotating in four dimensions, round its unimaginable center from which it is expanding, time travel into the past becomes instantly possible – all you have to do is drag your feet a little. How much energy it would take to drag your feet I am unable to tell you, but this has been seriously proposed. It could be done. Again, nobody knows in the first place whether the universe is a hypersphere or not, let alone whether it’s rotating, so we are in no position to say with great positiveness that time travel is permanently impossible.”*

– James Blish, [The Tale that Wags the God](#) (1987) (Kindle Loc. 592-597) <sup>16</sup>

## Endnotes.

<sup>1</sup> Commentary: Pirate Den (located in Canada) should not be confused with the infamous Swedish based website, The Pirate Bay, which was raided and its servers seized on orders from a Judge in May 2006.

<sup>2</sup> Citation: Dune Wiki timeline, May 30, 2018.

<sup>3</sup> Citation: Wookipedia canon, various articles on hyperdrive, Coruscant, galactic history, May 30, 2018.

<sup>4</sup> Commentary & Citation: I thought from the movie poster that *The Time Traveler’s Wife* (2009) might be a mushy romcom or melodrama, and you know how much guys hate that. It does get a bit melo toward the end, but how he gets shot is a surprise – though it should not have been because of the earlier hunting conversation (the old rule: nothing should be on the stage in the first act that is not used by the third act). His daughter (and Clare’s determination to have a child) is the epochal future hope from the film, in fact, it is the whole purpose of everything that happened to them, almost as if planned divinely. As usual, the critics weren’t very kind (these are the guys who send each other last years’ stale fruitcake loaf gifts for the winter Holidays) insisting that the movie stay within their predetermined genre boundaries (they don’t handle fuzzy very well), but I thought that Joshua Starnes of coming-soon.com was spot on in his August 6, 2009 review conclusion:

- ✓ “As it stands, *The Time Traveler’s Wife* is decent evening’s entertainment with an intriguing enough premise and some strong heart tugging to keep the women happy and the men from getting too bored.”

<sup>5</sup> Commentary: Suppose I had said, screw this, humanity can simply fall into the abyss for all I care and then deleted all of the files of GGDM and abandoned the project (deletion is necessary so that I don’t change my mind and go back). Humanity may still fall into the abyss, regardless. I certainly didn’t ask to be here, it’s not really fair or right in any way that I have to be on this planet or be alive anywhere and I don’t really care much for humanity?

- ✓ “What moral obligation do you have to those who willfully refuse to open their eyes and deem you mad for seeing?” – Norman Spinrad, [The Void Captain’s Tale](#) (1982).

Two things are certain: that you are reading this means that I did have those thoughts and that I did not – for unknown reasons, decide to delete the files. What meaning you wish to make of it, is up to you. Every author has made that choice, few other than John Milton have dared to ask, and none know why.

<sup>6</sup> Citation: “Why is quantum mechanics like cricket? Because for me, no matter how many times the rules are explained, I can’t seem to get my head around what the game is actually about. Is quantum theory a system of equations? A description of the behavior of invisible particles? A philosophy for the post-post-modern age?” – Kate Becker, “Debating the Meaning of Quantum Mechanics,” NOVA, November 1, 2011.

<sup>7</sup> Commentary & Citation: Examples of time travel games are the board games *Time Agent* (1992) and *Khronos* (2006), both of which I have played, and *Achron*:

- ✓ “*Achron* is a Real-Time Strategy game, with Time Travel as a major mechanic. It is also known as a Meta-Time Strategy game, due to the importance of Time Travel.... As a Time Travel game, *Achron* features a

completely free-form timeline, which is about 6 minutes long by default. Actions can be performed at any time on the timeline, and are propagated either by the players' observations, or by neutral timewaves. User actions are, however, limited to about 3 minutes in the past (on default settings), but units can be chronoported to the unplayable region, and events can be observed at any point on the timeline." – Achron Wiki, "Introduction to Achron," captured June 27, 2018.

- ✓ "Achron is considered to be the first 'meta-time strategy game' (Real-time strategy with time travel), notable for being the first game with free-form multiplayer time travel and its subtle handling of temporal paradoxes such as the grandfather paradox. Achron was released on August 29, 2011.... The unique aspect of gameplay in Achron is the fact that the game proceeds not only in many instances of space, but also in many instances of time. Players can simultaneously and independently play in the past, present, or future. The player can only travel a certain distance into the past – after a while, the timeline becomes permanent." – Wikipedia article, "Achron," captured June 27, 2018.
- ✓ Science fiction writer Mike Resnick is listed as one of the designers.

<sup>8</sup> Commentary: Thanks to the half dozen professionally-written, head-scratching 'timeline' and 'chronology' articles on the internet that have tried to piece together the continuity of the three generations of Planet of the Apes movies. I saw all of the original movies about 35 years ago, I cannot say that I remember them in detail.

<sup>9</sup> Citation: Information was gleaned from review of "Year of Hell" articles Memory Alpha Wiki, May 31, 2018.

<sup>10</sup> Commentary: My top time travel movies are 12 Monkeys (1996), the independent film, Navigator: A Medieval Odyssey (1988), and Frequency (2000). The list probably stretches some technicalities though – I think there is no actual time travel in Navigator and probably not in Frequency, unless you count collapsing timelines. A recent addition to my list of favorite "time movies" is Time Lapse (2014) which is more of a 'time trick' movie (*à la* Frequency). I also found The Time Traveler's Wife (2009) surprisingly good, so that can be added to my slowly growing list. The most recent, late 2019, addition to this list is the faux documentary, The History of Time Travel (2014).

- ✓ I have watched Primer (2004), but I need to watch it again. I have read a plot summary of Looper (2012) and a few other movies that I won't pay Amazon Prime to 'rent' since I already paid a yearly sub fee.

<sup>11</sup> Commentary: Julian May's Pliocene Saga addresses the real world 'Messinian salinity crisis' that was debated in the 1960s and 1970s: One of the psychic-powered characters blasted open the Straits of Gibraltar flooding the Tanu cities in revenge. This provides a literary origin for the 'Zanclean flood' at the beginning of the Pliocene era.

<sup>12</sup> Commentary: Dr. Paul T. Mason, Jr., Duquesne University Dept. of History, opined that we would be bowled over by the 17<sup>th</sup> Century odors as we are now used to living in a world with better standards of cleanliness.

<sup>13</sup> Commentary: If I were to meet a teenage version of myself, I would tell myself to shut up and listen. I really don't think I could stand my teenaged self now. I feel badly for the adults and teachers who had to bear my youth.

<sup>14</sup> Commentary: Again, this is probably the influence of Carl Sagan in my youth, who spoke about our technological adolescence and advance of civilizations. I am a clueless hack who has no new or original ideas.

<sup>15</sup> Commentary: In the Cosmos series Episode 7, Carl Sagan levels scathing criticism at the Pythagoreans and other ancient Greek philosophers for embracing and promoting mysticism; he goes on to blame the loss of the Ionian books, slavery in Athens, just about all human suffering and the fact that we are not currently on our way to the stars on mysticism and religion (see Sagan quote in Morality, 3 Order, pp. 548-549, and discussion in Dark Ages, 1 Technology, p. 686, *supra*). Many have objected to his characterizations of both mysticism and the Middle Ages. Carl Sagan seems to see mysticism as the natural enemy of empiricism and science, he would, as Douglas Adams commented at Digital Biota 2 (1998), "throw the baby out with the water," see quote in Another Duality, 1 Technology, pp. 693-695, *supra*. When I was younger, I am ashamed to say I would have agreed with Carl Sagan, largely because he was Carl Sagan. But given my intuition of parallelism, I would now – while Sagan does have some good points to make – view the Ionian situation differently.

<sup>16</sup> Commentary: If you cannot say with certainty what is possible then you cannot say what is impossible. It is related to truth, if one color is correct, then 15,999,999 other colors are incorrect. But if you can only say one color is incorrect, then there remains 15,999,997 incorrect colors and one correct color.