REASONS TO BELIEVE - SEATTLE AREA CHAPTER

NEWS AND VIEWS DECEMBER 2007

What's Happening?

New ID Website

The Discovery Institute has launched a new website for people searching for information on intelligent design. There are links to basic, non-technical information as well as peer-reviewed scientific papers. Visit the site at www.intelligentdesign.org.

Chapter Meeting

The next Seattle Chapter meeting has been rescheduled for Saturday, February 9, 9:00 A.M at Calvin Presbyterian Church in Shoreline. David Marshall, of Christ the Tao Ministry, will speak on his ministry and his new book on worldview apologetics. This is a great opportunity to get involved with the chapter. Please plan to join us!

We Do Presentations

The Seattle chapter does presentations on wide range of topics ranging from the scientific evidences for God, to the age of the earth debate. If your church or group is looking for speakers, contact us at seattle@reasons.org.

Inside This Issue

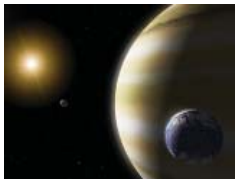
The Search for Extraterrestial Life

DR. JOHN MILLAM

[Note: This is Part 2 of this article. Part 1 appeared in November.]

EXTRA-SOLAR PLANETS – THE FAILURE OF THE COPERNICAN PRINCIPLE

The Copernican principle holds that there is nothing special about our solar system and hence other stars in our galaxy should have their own solar systems that resemble our own. Our own solar system contains four small inner rocky planets (Mercury, Venus, Earth, and Mars), two gas giant planets (Saturn and Jupiter), and three ice planets (Uranus, Neptune, and Pluto).[49] SETI expectations were built on the assumption that most other solar systems should be veritable carbon copies our own. As such, the discovery and characterization of extra-solar planets was expected to be the crowning vindication of the hopes and expectations of SETI astronomers. The first official detection of an extra-solar planet came in October 1995 with the detection of a Jupiter-sized object orbiting about the star 51 Pegasi about 50 light years away from us. This confirmed for the first time that planets do indeed exist outside our solar system. Since that time, over 100 planets have been discovered orbiting other stars.[50,51] Now that we have a large enough sample of planets to analyze, what can we learn from them?[52,53]



1. Newly discovered solar systems are not like our own. Based on the Copernican principle, astronomers expected other solar systems should be much like our own. However, even a quick survey of the newly discovered solar systems shows that all of them differ radically from our own. So different are these solar systems from anything predicted that it begs the question, "Who ordered that?"[54] The extra-solar planets can be split into three categories. (a) Large Jupiter-like gas giant planets that orbit extremely close to their star, such as the planet near 51 pegasi. Such a massive planet would eject, destroy, or prevent from forming small rocky planets that are necessary for life. (b) Large Jupiter-like gas giant planets that orbit at near the correct distance but have highly eccentric orbits. Eccentric means that the planets orbit in an elliptical (rather than near circular) pattern. Because of their mass, Jupiter-like planets with eccentric orbits would disrupt the orbit of smaller inner planets. (c) Solar systems containing no giant gas planets. Through gravitational lensing,[55] astronomers were able

to detect one small planet (with a mass between that of Earth and Neptune) near the star MACHO 98-BLG-35.56 This planetary system is missing a large Jupiter-like planet necessary to protect the smaller planet from cometary bombardment. In all of these cases, there is no hope for finding any form of advanced life.

2) Gas giant planets are rare. Our Jupiter acts a "cosmic shield" protecting Earth by either deflecting or absorbing (as in the case of the recent Shoemaker-Levy collision) comets and asteroids that wander into the solar system.[57,58] Without Jupiter, Earth would have been bombarded 1,000 times more often than we had been. Such an increased bombardment would regularly wipe out any advanced life. Prior to the discovery of the first extra-solar planet, astronomer George Wetherill predicted that most young solar-type stars lose the gas in their proto-planetary disks before gas giant planets (like Jupiter and Saturn) can form.[59,60,61] Based on spectroscopic analysis of 20 young stars, only one retained enough gases to form gas giant planets. Wetherill also noted that a search of two dozen solar-type stars had failed to find any planets. Based on current discoveries, only about 6% of solar-type stars can be expected to have giant planets, which is consistent with Wetherill's theoretical predictions.[62]

3) Planets require lots of "metals." Astronomers are finding that planets only form around "metal"-rich stars. To astronomers, "metals" refers to any element heavier than helium. Since the big bang produced only hydrogen and helium, "metals" can only be produced later in the history of the universe from the nuclear furnaces of stars. As such, the concentration of metals in a forming solar system is critically dependent upon its having formed upon the metal enriched ashes of two previous generations of stars. Since planets are built up almost entirely of metals, it is not surprising that a certain minimum amount of metals are required to have planets. Our own sun is very rare because it is so metal-rich (with metals making up about 2% of the solar mass) compared to stellar neighbors of roughly the same age and type. Almost all of the extra-solar planets discovered so far orbit very metal-rich stars. While the exact relationship between metals and planet formation is still unknown, the requirement for metals certainly reduces the number of possible planetary systems.

4) Drifting gas giant planets. A probe dropped into Jupiter's atmosphere showed that the planet still contained high levels of argon, krypton, and xenon. The only way to explain the presence of these noble gases is that the planet formed under very cold conditions (below -406 °F). These conditions only exist outside the orbit of Pluto, which means that Jupiter must have formed there and later drifted inward to its current position.[63] This drift has to be fine-tuned, since if it drifted to close to the sun, it would destroy the inner planets. If it didn't drift in far enough, it would not have protected our planet from cometary bombardment. If it drifted the right distance but did not maintain a circular orbit, it would disrupt the inner planets.[64] In nearly all of the 100 extra-solar planets, these large gas giant planets either drifted in very close to their star or ended up with very eccentric (non-circular) orbits.[65]

GALATIC HABITABILITY – DANGEROUS STELLAR NEIGHBORHOODS

Astronomers have discovered that our own galaxy is full of dangers that are capable of disrupting or destroying possible life sites. Where as Drake and Sagan confidently assumed that only the nature of the star and its planets were relevant to the question of habitability, we are now forced to recognize that a star's stellar neighborhood

Continued on page 4

In the NEWS...

Beowulf Reinvented

This Breakpoint article by S. T. Karnick examines the new movie *Beowulf*. He gives the film a thumbs-up, stating the transition from paganism to Christianity portrayed in the film has a powerful redemptive message for Americans and Europeans. Go to: http://www.breakpoint.org/listingarticle.asp?ID=97.

Are Miracles Possible?

This article by Dinesh D'Souza examines the claim that miracles are contradictory to science. He maintains miracles can't be deemed unscientific because our knowledge of causation is not so extensive in extreme cases as to rule out supernatural causes. Go to http://www.tothesource.org/11_20_2007/11_20_2007.htm.

Resource Packet

As part of their response to the PBS-NOVA documentary "Judgment Day: Intelligent Design," the Discovery Institute has developed a resource packet for educators who want to effectively teach about the debate over biological origins. A free download is available at http://www.evolutionnews.org/2007/11/a_new_resource_for_educators_d.html.

Stem Cell Breakthrough

This Breakpoint article discusses a recent breakthrough where scientists reprogrammed the chromosomes of skin cells turning them into what appear to be embyonic stem cells. and how some rearchers see this as bad news. Go to: http://www.breakpoint.org/listingarticle.asp?ID=7297.

Fragile World, Strong Faith

This *Christianity Today* article discusses the relevance of Augustine's counsel for those living in turbulent times. Namely, that we are to avoid cynicism, while at the same time avoiding the lure of utopianism and thinking we can solve all our problems, Go to: http://www.christianitytoday.com/ct/2006/september/1.78.html

Book Reviews

Explore Evolution

Stephen Meyer & Others
Hill House Publishers, 2007

Reviewer: Mike Brown

This is a great new resource for high school and college students to evaluate evolution. It is extremely well done. The format is an 8x10, full-color, glossy, soft-cover textbook. The text portion is about 140 pages long. The pictures and illustrations are excellent!

In the preface, the authors point out they are using the "inquiry-based" approach which allows the student "to follow the process of discovery, deliberation, and argument that scientists use to form their theories. It allows you to evaluate answers to scientific questions on your own and form your own conclusions." For each subject addressed, the authors provide the case for the neo-darwinian argument, followed by a reply from critics. They point out that the reply section will be larger since the student will have already had the major case for presented in their science classes.

The first section deals with "Universal Common Descent" addresses fossil succession, anatomical homology, molecular homology, embryology, and biogeography. The second section addresses "The Creative Power of Natural Selection" and deals with natural selection and mutations. The third section is titled "A New Challenge" and deals with the issue of the complexity of molecular machines. The last section titled "Special Studies" deals with natural selection and survival of the fittest, with a final chapter reviewing what fossils cannot tell us.

It is encouraging to see such excellent materials being produced to help our students–and teachers–evaluate the latest evidence and see the various scientific explanations. In the conclusion, the authors make the following statement:

> "When one hears about a biologist who questions the theory of Universal Common Descent, one might typically assume that he (or she) rejects evolution altogether. Conversely, one might assume that every biologist who accepts Common Descent is also a neo-Darwinist. But the actual diversity of views about the history of life is far more complicated and interesting than that."

Heritage of Evidence

Peter Masters
The Wakeman Trust, 2004

Reviewer: John Battle

Peter Masters is the pastor of the Metropolitan Tabernacle in London, the church previously pastored by Charles Haddon Spurgeon. Dr. Masters is also active in theological education and is a brilliant Bible teacher with a keen interest in biblical history and archaeology.

One of the premier sites in London is, of course, the world famed British Museum. Upon entering the museum, the visitor is confronted with many guides sporting various specialties on their name tags, including "Bible" tours of the museum. Even so, having spent hours in the museum while I was in London, I found out after I came home that there were several items in the museum related to the Bible that I did not know were there and, of course, did not see. That was most frustrating. However, Masters's book is the next best thing to being there.

Masters takes the reader on a guided tour of the British Museum, a tour designed to show the various artifacts' relation to the Bible history. The British Museum is especially strong in Egyptian and Assyrian history, and these have many points of contact with the Bible. Masters describes the various displays and artifacts, with many detailed photographs, and shows the passages in the Bible that are involved. At the end of the book Masters includes several important artifacts found in other museums as well, to round out the fabulous collection in the British Museum.

The net effect is to see that the Bible is indeed accurate in its history, agreeing with the best ancient history revealed through archaeology. Not only that, but these ancient writings and artifacts actually help us understand many biblical portions that may be obscure otherwise. This book is a great tool in apologetics, illustrating in a detailed and interesting way the historical trustworthiness of the Bible. Since the book is published by a non-profit firm (The Wakeman Trust), its cost is much lower than a comparable book would be.

and its position in the galaxy are no less critical. To quote a famous real estate adage, it's all about "location, location, location." Several aspects about a star and its relationship to its parent galaxy must be considered.

1. Galactic dangers. While astronomers have long known about dangers to solar systems caused by nearby objects, they are now considering hazards posed by even some very distant objects. One such danger comes from supernovae. A supernova is a tremendous explosion that occurs when a massive star runs out of fuel and explodes, showering everything around it with high-energy particles and deadly gamma-ray radiation. For a brief time, a supernova can shine brighter than 100 billion suns! A nearby supernova would sterilize a planet and alter its atmosphere but even more distant supernovae can put out enough to cause mass extinctions. A new type of galactic danger, gamma-ray bursts, poses an even greater threat than supernovae. Gamma-ray bursts occur when ultramassive stars run out of fuel and collapse into a black hole. For a brief moment, a gamma-ray burst event can radiate brighter than 10 billion billion suns (i.e. 100 million times that of a supernova) and cause damage to solar systems 1,000 (or even 10,000) light years away.[66] Very distant gamma-ray bursts may have been responsible for some large-scale extinction events on the earth.[67]

2. Galactic habitable zone. The galactic habitable zone represents another of Goldilocks' "just right" compromises. Stars located too far from the center of the galaxy will lack sufficient material for the formation of rocky planets. For stars that are located too close to the center of the galaxy, the density of stars would be so large there would be a high probability of disruption caused by stellar neighbors that come too close. In addition, stars close to the center would also be subject to large amounts of radiation from the galaxy's core.

3. Dangerous galactic spiral arms. Astronomer William Keel has shown that it is important for a habitable planet stay out of the galactic spiral arms.[68] The spiral arms contain a much higher density of stars such that the gravity from nearby stars would likely pull planets out of their habitable zone. In addition, the spiral arms contain many supergiant stars. Supergiant stars are extremely massive and luminous stars that pump out so much radiation that they would damage the atmosphere of planets around neighboring stars. Dust in the galaxy resides primarily in solar arms and acts as a blanket shielding stars outside the spiral arms from this dangerous radiation. When supergiant stars collapse, they become supernovae and become an even greater threat to nearby stars.

4. Staying between galactic spiral arms. Our solar system resides safely between two galactic spiral arms remaining safe from both. However, it is not enough to simply reside between spiral arms but to do so for most of the lifetime of the solar system. This will only happen if the parent star is orbiting the center of the galaxy at the same rate as the spiral arms. If the star is revolving too fast or too slow around the galactic core, it will eventually be swept into either of the spiral arms where it will be subjected to gravitational disturbances and radiation from supergiant stars. Only stars, such as our own, that reside near the galactic corotation distance will remain in sync with the spiral arms and be able to avoid being swept into them.[69]

5. Z-axis bounce. As a star orbits around the center of the galaxy, its motion may take it above or below the plane of the galaxy. Stars for which this motion is too large in either direction will be hit by large doses of radiation coming from the galactic core. Only stars that remain close to the plane of the galaxy will be protected from this harmful radiation.

REASSESSING THE DRAKE EQUATION

The discovery of extra-solar planets as well as newer models of solar system formation have shattered the assumption that our solar system is the cosmic norm. A plethora of other discoveries about our own solar system are showing just how many things had to be "just right" in order for Earth to be habitable. The best way to evaluate the implications of these new discoveries is to reevaluate each term of the Drake Equation in light of this flood of new data.

1. Just What Makes a Star Suitable: Reassessing f_s – For a planet to even have a chance of being habitable, it must orbit a "suitable" star. In his original work, Drake realized that certain types of stars would be too extreme to keep even one of its planets at the right temperature to maintain liquid water. Drake, however, did not go far enough in considering other stellar properties that might render a star "unsuitable." For the last 40 years, astronomers have been cataloguing many additional properties of a star that affect its ability to support a habitable planet. Only a few prominent criteria are listed here.

(a) Roughly half of all known stars are binary stars (pairs of stars that orbit each other). The idea of a planet having multiple suns is very romantic idea (look at the planet Tantoine in the movie Star Wars) but is unsuited for the presence of life. Any planets in orbit around binary stars would have very unstable orbits at best, which would subject the planet to large temperature oscillations.

(b) Of non-binary stars, we can safely rule out non-main sequence stars, such as white dwarf stars (too cold), red giants (too hot), and neutron stars (too violent). For main sequence stars, the star's life time and hence its "suitability" is determined by its mass. Large stars (at least 65% larger than our sun) will use up their nuclear fuel so fast that they would burn out too rapidly. Smaller stars (at least 40% smaller than our sun) would have a "Goldilocks" zone that would be too small. That is, the region around the star that maintains the planet at the right temperature is so close to the star that it subjects the planet to tidal forces that would disrupt the rotational period of the planet. Such a disruption would result in one side of the planet always facing its sun, which would overheat while the opposite side would freeze. Of all known star types, only bachelor G2 stars (a class of yellow stars like our own) are likely candidates for life. Only these stars have the right

size, brightness, and long-term stability to considered suitable for life.

(c) Only third generation stars have enough heavy elements to allow the formation of rocky planets. The earliest stars to form started with only hydrogen and helium from the big bang. As these first generations die in supernovae explosions, they produce and expel heavier elements. The second generation stars, drawing on the ashes of first generation stars, still lack the elements to make rocky planets needed for life. Only after this second generation of stars die in supernovae are there enough heavy elements for the third generation of stars to have rocky planets. (Fourth generation stars exist but are rare.)

(d) In addition to the star's mass, the star's age is also a factor. If the star is either too young or too old, the luminosity (brightness) of the star will vary too much. Large fluctuations in the star's luminosity would result in runaway freezing or runaway heating of the planets. Such fluctuations would be disastrous to possible life forms.

2. Just How Common are Planets: Reassessing f_p – Drake, Sagan, and other SETI astronomers assumed that about half of all stars should have planets based on the existing models of their day. New evidence is showing that planet formation is much less frequent than had been expected. The Hubble Space Telescope was used to look for planets in the globular cluster of stars[70] called 47 Tucanae. Based on existing expectations, they should have found 17 planets but instead found zero.[71] Based on this new evidence, planet formation is at least 100 times less common than was anticipated ($fp \approx .1\%$).

3. Just What Makes a Planet Suitable for Life: Reassessing n_e – Again, we encounter the notion of being "suitable." Just what is "suitable" for life? The very favorable value of n_e used by SETI enthusiasts, is based on assuming that there is just one criterion: the planet must be in the "Goldilocks" zone so that it can support liquid water. There are, however, many other factors about the solar system as well as the planet itself that must be properly balanced for life to be possible. Analysis of the recently discovered solar systems located around other stars show that favorable solar systems are certainly not guaranteed. Only a few prominent criteria are listed here.

(a) "Just right" Jupiter. Our Jupiter acts a "cosmic shield" protecting Earth from deadly bombardment that would exterminate life. A solar system not having a large Jupiter-like gas giant would subject inner planets frequent deadly bombardment. However, having a large gas giant planet is not enough, because it must also have a near-circular orbit, have the right mass, and must orbit the right distance away from the star. If not, these gas giants would wreak havoc with the delicate inner planets eliminating any possibility of life. The discovery of extrasolar planets have confirmed that "just right" Jupiters are not guaranteed or even likely.

(b) "Just right" Moon. Our moon is more than just a beautiful light to fill the night—it is a critical component to maintaining life on this planet.[72,73] The moon plays a key role in stabilizing the obliquity (tilt of the rotation axis relative to the orbital plane) of the Earth. Without the moon, the Earth's tilt would be unstable, causing destructive climatic changes on Earth. What makes the moon so unusual is that it is quite large relative to the mass of the Earth. The moon's large mass means that our moon is more like a second planet than a moon. Current models suggest that our moon formed when a Mars sized boulder struck the Earth at an angle kicking up a lot of debris that would eventually coalesce in the moon. Such a collision requires a high degree of fine-tuning! A direct collision would have been disastrous and a glancing blow would not have given rise to the moon. (This moon forming impact may also explain why we do not have a thick CO2 atmosphere like Venus that would have kept the Earth too hot for liquid water and life.)

(c) "Just right" Planet. Simply having a planet the right distance from the star is not enough for a planet to be habitable. A careful study of our own planet has revealed that there are at least 20 different aspects of our planet that must be carefully balanced for there to be life and this list is growing every year! These parameters include plate tectonics, orbital eccentricity, surface gravity, magnetic field, and the thickness of the crust to name a few. Habitability and hence life are critically dependent upon all of these things balanced between opposing extremes and the failure of a planet to stay within these narrow boundaries on even one parameter would prevent or exterminate life on that planet.

4. The Question of the Origin of Life: Reassessing f_l – Currently, only our planet is known to harbor life and there is still much debate about how life began here. SETI proponents assume that since life appears very early in Earth's history, life arises easily, spontaneously, and without help from God. Such optimistic speculation is the basis of the SETI philosophy and is the whole motivation behind the search for life elsewhere in the universe. Advances in biochemistry and genetics show in increasing detail the incredible degree of complexity in even the simplest organism. Information theory applied to the origin of life question shows us that not even the simplest organism will form by purely natural processes, even given the long periods of time involved. A detailed discussion of this subject is beyond the scope of this paper.[74,75,76,77,78,79] Given the evidence, we have to conclude that f_l is zero!

5. Is Intelligence Guaranteed: Reassessing f_i – It has long been assumed that intelligence is guaranteed by evolution and hence that f_i should be large. In more recent times, there have been a number of challenges to this assumption. One argument for a small value for f_i comes from the Carter's dilemma. Brandon Carter noticed that while microorganisms show up very early in the fossil record, intelligent life (namely us) doesn't show up until very late in the history of our planet.[80] That is, intelligent life did not appear until nearly half the available time (the lifetime of our sun) was gone. So, even if intelligent life was guaranteed to evolve (and of course there is no such guarantee), there is no guarantee that it would appear soon enough before being wiped out by its dying sun or by other catastrophes.[81,82]

Not only would intelligent life have to occur before the death of its parent sun, it would have to be kept sufficiently safe from various disasters over astronomical periods of time. There are many disasters that could halt or even destroy life on a planet. Recent work on Mars, suggests that our planetary neighbor might have been much more habitable than it is now and may even have had liquid water. Any life that might have existed (except possibly microbes) would have been destroyed by whatever forces brought about this catastrophic change in Mars' climate.[83] Today, Mars is cold, barren and unfit for life.

OUR "JUST RIGHT" GALAXY

Over the last 40 years, we have discovered that a great number of things have to be "just right" in our solar system in order to have life on Earth. The discovery of planets orbiting other stars underscores this point by showing that habitable solar systems are certainly not guaranteed. We are now faced with the realization that even given the vastness of our galaxy, the probability of having even one other planet forming by natural processes alone with the necessary conditions to support advanced life is negligible. Given the improbability of having even one other habitable planet in our galaxy, the quest for extraterrestrial beings will be forced to look outside our own galaxy.

According to the Copernican principle, most galaxies should be like our own. Since our galaxy contains at least one intelligent civilization (namely us) and there are an estimated 10 billion galaxies in our universe, one might expect that there should be at least 10 billion advanced civilizations in our universe. (If we used SETI's optimistic estimates instead this would skyrocket to a staggering trillion or even a quadrillion intelligent civilizations in the universe.) Recent findings by astrophysicists are showing the Copernican principle fails even for galaxies so that the vast number of galaxies does little to bolster the idea of extra-terrestrial civilizations. For example, only spiral galaxies like our own can support star formation long enough to have very metal-rich stars that are capable of having rocky planets. Similarly, galaxies that are located close to other galaxies are unsuitable because the gravity of nearby companions would disrupt solar systems. A galaxy capable of supporting habitable planets must be a middle-aged, medium-sized, spiral galaxy with sustained star formation located in a safe cosmic "neighborhood." Using only five of these galactic parameters, we can rule out 99.999% of all galaxies as possible candidates for having habitable solar systems. Given current trends, it is likely that the number of galactic fine-tuning parameters will only increase, not decrease. We indeed reside in a very privileged portion of the universe.

THE DESIGN INFERENCE

Astronomers now recognize that our sun, planet, and even our galaxy had to have a lot of things "just right" in order for us to be here. For example, if the distance from Earth to the sun were just slightly larger or smaller than the current value, there would be a catastrophic runaway freezing or heating that would exterminate or prevent life on our planet. This quality of being "just right" or "fine-tuned" is sometimes referred to as "design" because of the comparison with humanly designed systems. For example, the gears in a mechanical watch must be precisely the right size in order to connect with other gears. In addition to that, the gear sizes must also be precisely chosen for the watch to correctly measure time. Even small changes in the components of the watch would cause the watch to fail or keep the wrong time. We explain the correct functioning of a watch by recognizing that the watch was designed by an intelligent being. If our solar system and planet have the property of being "fine-tuned" like a watch, then we may infer that if the watch needs a designer, then so must our solar system and planet. Known as the design inference, this stands in direct opposition to the Copernican principle.

During the inception of SETI and the Drake equation in the 1960's, astronomers assumed that a solar system only had to get a two things right (i.e. the right star type and stable planets) in order for there to be a suitably earth-like habit for life.[84] By 1970 when SETI was just a decade old, the number of design parameters (things that have to be "just right") jumped from just 2 to 8. Each new design parameter reduced the predicted number of possible life sites in our universe. By 1980 this number rose to 23, by 1990 it was up to 32 parameters, by 1995 it had reach 41 and in 2001 it reached 128. Currently, there are at least 153 design parameters and this list of parameters continues to grow with no apparent end in sight.[85] Given these design parameters, we can conservatively estimate that even given the entire universe with 10 billion galaxies each containing 100 billion stars and planets, the probability of having even one solar system form by chance that has the necessary properties for life is less than 1 chance in 10172! Clearly then, the Earth cannot simply be a fortuitous accident but is the product of design by a caring Designer.

For the most part, SETI proponents have simply chosen to ignore this growing list of requirements for habitability. Except for the addition of the term, f_s, the Drake Equation has remained the same, effectively refusing to recognize the advances and discoveries of the last 40 years. Similarly, estimates of the number of advanced civilizations have remained almost constant, although modern estimates are a bit more conservative. SETI believers who have commented on these design requirements, typically dismiss them as mere quirks or eccentricities of our own solar system and are not really essential requirements for habitability.[86] Sadly, outside of astronomy, most of these design parameters are not well known, and when they are presented, typically only a few are mentioned. The popular press has done little to challenge the popular SETI notions or educate the public about this growing body of evidence for design.

RARE EARTH

After decades of mounting evidence, only now are other scientists

beginning to reevaluate their expectations for life elsewhere in the universe. Using only eight criteria (design parameters) for the existence of intelligent life on other planets, Robert Naeye, concludes that we likely to be alone in the galaxy. He states:

> "Recent studies in a variety of fields suggest that life must pass through a series of bottlenecks on the road to intelligence. On Earth, a long sequence of improbable events transpired in just the right way to bring forth our existence, as if we had won a million-dollar lottery a million times in a row. Contrary to the prevailing belief, maybe we are special. Maybe humanity stands alone on a fertile island in the largely sterile waters of the galactic ocean."[87]

It should be recognized, Naeye comes to this conclusion based on existing evidence even though he sincerely hopes that SETI will eventually prove him wrong by detecting life.[87] If only eight design parameters are enough to convince him that we are likely alone in the galaxy, we can only wonder what conclusions he would make if he considered all 153 design parameters!

Astrobiologists Peter Ward and Donald Brownlee are also among a growing number of scientists who are challenging the prevailing view that advanced life is common in the universe. Based on their own compilation of requirements for habitable planets, they conclude that intelligent life is exceedingly rare in the universe, even though they start from the assumption that life can arise spontaneously.[88] In the introduction to their book Rare Earth, they state:

> "In this book, we will argue that not only intelligent life, but even the simplest of animal life, is exceedingly rare in our galaxy and in the Universe. We are not saying that life is rare–only that animal life is... We combine these two predictions of the commonness of simple life and the rarity of complex life into what we will call the Rare Earth Hypothesis." (Emphasis theirs.)[89]

After surveying what the last 40 years of astronomy has indicated about the possibility of extraterrestrial life sites, they conclude their findings by giving a revised version of the Drake Equation that includes additional factors to incorporate a few of these new findings. They conclude:

> "Many new factors will be known, and the list of variables involved will undoubtedly be amended. But it is our contention that any strong signal can be perceived when only sparse data is available. To us, the signal is so strong even at this time, it appears that Earth indeed may be extraordinarily rare." (Emphasis mine.)[90]

It then appears that the Copernican revolution has come full circle. So, while we are clearly not at the geometrical center of the universe, evidence for design is showing that we are indeed very special.

NOBODY HERE BUT US EARTHLINGS

University of Washington astronomer Guillermo Gonzalez is frequently asked, "Are we alone?" In his article, "Nobody Here But Us Earthlings," he states that:

> "My answer to the question ['Are we alone?'] almost always catches people off guard: Very likely yes, we are alone. When one looks at the astronomical data with an open mind, it becomes quite obvious why we have not found any evidence of extraterrestrial life."[91]

Contrary to the popular assertions of Carl Sagan, Frank Drake, SETI, and others, we are likely to be alone in the entire universe, not just in our galaxy. Multiple lines of evidence are converging to support this conclusion. To summarize what we have found:

1. Fermi's Paradox. The complete lack of any credible evidence for extraterrestrials having already visited our solar system argues that advanced extraterrestrial civilizations are rare or non-existent.

2. Failure to Detect Any Signals. After 40 years of searching, we have not found a single blip from an extraterrestrial civilization. While this doesn't completely eliminate the possibility of advanced beings, it certainly does put strong limits on their existence and level of technology.

3. Discovery of Extra-Solar Planets. Both Drake and Sagan confidently assumed that other solar systems should resemble our own. The newly discovered planets have completely turned this assumption on its head. None of these solar systems are even remotely hospitable. This is perhaps the strongest experimental evidence against SETI claims.

4. Dangerous Stellar Neighborhood. It is not enough to have the right star and planet to have a habitable planet. A star must be located in just the right portion of the galaxy where they can be protected from radiation and gravitational disruption from stars in its local neighborhood for the lifetime of the planet. Supernovae and gamma-ray bursts represent violent endings to massive stars that pump out unimaginable amounts of energy capable of destroying life and disrupting planetary atmospheres out to hundreds or even thousands of light years.

5. Failure of the Copernican Principle. When SETI was born, astronomers assumed a solar system only had to have two things right in order to have a habitable planet and so habitable planets should be plentiful. Scientists now recognize that a great number of attributes must fall within narrow limits to even have a chance of being hospitable.

6. Failure of Naturalistic Explanations for the Origin of Life. A naturalistic origin of life is prerequisite for life on other planets. In Darwin's time, cells appeared to be little more than bags of protoplasm, so the origin of life seemed like it should be very easy. Now, scientists realize that even the simplest organism is more complicated and better managed than even the finest human factories. The DNA of a single cell contains more information than several sets of the Encyclopedia

Britanica. Naturalistic theories fail to account for this intricate design and information content.

7. Late Appearance of Advanced Life (Carter's Dilemma). While single celled organisms appear very early in Earth's history, advanced life appears very late. So, even if simple organisms were to develop, there is no guarantee that advanced life would appear before the death of its sun or other cosmic catastrophes.

WHY ARE WE HERE?

Under the SETI paradigm (Copernican principle), our existence is guaranteed without God's help simply by virtue of the billions of galaxies each containing billions of possible stars and planets. However, given the enormous and growing body of evidence for design, we can safely rule out the possibility of finding other habitable planets teeming with intelligent life. Clearly the Earth cannot simply be a fortuitous accident and thus, we are very likely alone in the universe. This gives us reason to pause and reflect on the meaning of it all. At the end of his article, "Nobody Here But Us Earthlings," Guillermo Gonzalez concludes:

> "We should not be asking: 'Are we alone?' We should be asking instead: 'Why are we here?'"[92]

The question of our existence used to be the domain of theology alone but now science is adding some new details to the story. Modern astronomy is testifying to the fact that our galaxy, our solar system, and our planet reflect the careful craftsmanship of a Designer rather than the random fortune of the Copernican Principle. Long ago, King David looked up at the heavens and concluded, "The heavens declare the glory of God, the skies proclaim the work of his hands."[93] If only King David could have seen the universe as we see it today.

Dr. John Millam has a Ph.D. in theoretical chemistry from Rice University and is a trained RTB apologist. For a complete copy of his article including appendices and materials dealing with other issues, he can be contacted at john@semichem.com.

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Seattle Chapter Reasons To Believe

Who Are We?

The Seattle Chapter of Reasons To Believe is a local extension of the worldwide, interdenominational Reasons To Believe ministry. We exist to support our parent organization and foster local involvement in the ministry. We serve the Puget Sound area and are composed of Christians of different ages and backgrounds.

It is our conviction that the same God who created the universe inspired the Bible. Therefore, what God says through His word must agree with the facts of nature. We reject the notion that science and the Bible are at odds and provide a scientifically-sound and Biblically-faithful alternative to Darwinism and young-Earth creationism.

What Do We Do?

Our mission is to remove the doubts of skeptics and strengthen the faith of believers. We provide scientific, historical and philosophical evidence that supports the Christian worldview and helps remove barriers to a belief in God, the Bible and the Gospel of Jesus Christ. We carry out this mission by:

- Helping people access RTB and other scientifically and biblically sound resources.
- Bringing nationally-known speakers into the area to promote the scientific reliability of the Bible.
- Assembling a team of local apologists to address questions about science, the Bible and related topics.
- Working with teachers and homeschoolers to achieve a balanced approach to the teaching of origins.
- Building alliances with local churches, ministries and groups to maximize the exposure of the RTB ministry.
- Reaching out to unbelievers with gentleness and respect, encouraging them to evaluate their worldviews.

We welcome your involvement and support. For more information, contact us at seattle@reasons.org. Tax-deductible donations can be sent to: Seattle RTB, PO Box 99683, Seattle, WA 98139-0683.

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