A Psilent Place Below

~~Ideas for Lesson Plans & Discussion Topics~~

Star Trails contains various lessons which are likely to be missed by casual readers. If used as part of a learning module those lessons can be pointed out and used as discussion points. Everyone makes mistakes, even adults, and it is much more effective to learn vicariously from those made by others, particularly fictitious characters, than make the same mistake yourself. This is also an opportunity to explore the science aspects in greater detail as part of science class curriculum or even explore the world of metaphysics. What follows is a summary of potential lessons contained in various chapters with suggested discussion topics that can prompt assignment ideas.

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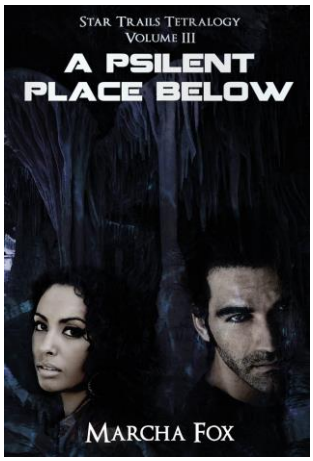
Volume III: <u>A Psilent Place Below</u>



- **Creative problem solving, use of fault trees to cover project or engineering contingencies and real-time applications.**
- **Cavern formation and geology.**
- **Nonverbal communication including body and sign language, telepathy and psi ability.**
- **Metaphysical precepts such as veridical dreams and spiritual intervention.**
- **All is fair in love and war.**
- **Different cultural norms can clash with your own; indigenous cultures have a quiet wisdom lost in "advanced" civilizations.**
- **Properties of crystals such as birefringence and refraction.**
- **Political structures and differing ideologies.**
- **Risk of hasty conclusions and emotional reactions when all the facts aren't available.**

Chapter 1 (*Enoch)*

1. What's the difference between a cave and a cavern? Caves are typically no more than a natural gap or hollow within a larger rock formation. The Earth is approximately 10% limestone which formed from marine shells when most of the planet was under water. Carbon dioxide in the soil is acidic and eats away the limestone to form calcite. There are many different kinds of water, depending on its acidity. Most common to experience is fresh water, such as that found in most lakes and rivers, and salt water such as that found in the oceans and seas. Salt water has a lower oxygen content which is why animal life that can live in fresh water may not survive in the ocean. Salt water does not erode limestone. Sometimes the water

in a cave can be hazardous and even comprise sulfuric acid when hydrogen sulfide gas from deep in the Earth's crust bubbles up from oil deposits and is absorbed into the water. The sulfuric acid dissolves the limestone and forms gypsum, most commonly known as the substance in sheetrock which is commonly used for walls in building construction.

Caverns typically form when fresh water, often from rain, drips through limestone and dissolves it which can open up large underground areas as well as form stalactites and stalagmites. A stalactite is a vertical formation that starts overhead which is created as the water evaporates and leaves the limestone behind. It can be as fine as a needle or thick as a column and grows slowly with time, sometimes on the order of a millimeter over many years. A stalagmite is similar except it starts from the ground and works its way up. In may cases the stalagmite grows from water dripping from a stalactite and eventually the two will meet and form a column. It's easy to remember which is which because a stala**c**tite starts at the **c**eiling and a stala**g**mite starts on the **g**round. There are many caverns with these formations including Natural Bridges Caverns in the Texas Hill Country and Carlsbad Caverns in New Mexico. Some caverns are formed by underground rivers called aquifers which hollow out the rock in its path. These will typically have fewer stalactites and stalagmites but will show where whirlpools and eddies formed patterns in the rock along with other types of crystal formations. A typical cavern of this type is Longhorn Caverns between Marbles Falls and Burnet, Texas.

It is totally dark within a cavern which blocks all outside light once you are far enough from the entrance. Nonetheless various species will call a cavern home. Bats are typically associated with caverns. Since they are blind the darkness is irrelevant. They sleep in the cave or cavern by day and come out after sunset to catch insects. Caverns often have a dank, musty unpleasant odor which results from the bats' waste known as guano, which makes an excellent fertilizer. It's normal for thousands and even millions of bats to occupy a cavern. They typically hibernate in the winter. In some cases cockroaches who occupy the cave eat the guano and the bats, in turn, eat the cockroaches, creating a synergistic life cycle between the two species.

Deer Cave in Borneo is so huge that the largest jumbo jet could fly through it. It is home to three millions bats. Certain species of birds also nest in caverns such as some swallows and cave swifters. Cave swifters in a cave in Borneo build their nests from their own saliva, which takes approximately a month to build. These nests are the main component of "birds' nest soup" which is considered a delicacy. Other species that can live in caves include huge centipedes, salamanders, crabs and fish. Without light they are blind. It takes thousands of generations for eyes to evolve yet it would only be a matter of weeks before you would go blind if confined to total darkness.

The activity of exploring caves is known as spelunking. There are many hazards involved and it should only be done with a properly trained and experienced guide. Exploring areas under water requires diving gear and is even more dangerous due to the possibility of becoming lost within hundreds of miles of passageways.

The temperature within a cave is usually within a small range due to being insulated by the surround earth and rock. Most Texas caves are around 68 degrees year round, making them a haven from summer's heat.

2. Earth has diverse climates and environments yet most are occupied by human beings and have been for centuries. From extreme Arctic conditions to the desert, people adapt and survive. The most populated regions are mostly in what are known as the temperate zones where there are usually four seasons and moderate weather. Modern conveniences have made living in some of the harsher areas easier. Consider what it would be like to live in your own area without any technology. What about living in an area very different from what is familiar. How would you like living in an area like Alaska where the Sun barely shines in the winter yet hardly sets in the summer? What about somewhere like Central America where the temperature and weather is similar most of the year? Do you like cold or hot weather better? What are the pros and cons of the different climates?

3. Unfamiliar cultures, people and races can seem strange and scary. Even within an area such as a single state there can be cultural differences. These usually evolve through necessity which eventually becomes tradition with the origin often long forgotten. Nonetheless cultural norms or habits came about for a reason that may not be understood by those outside the group. Whatever culture you are raised within will seem normal with anything different from your own strange and unfamiliar. You may even think others are actually wrong. Moral judgments of a culture you do not know or understand can be unfair without knowing the practice's origin or rationale. The study of anthropology examines other cultures, their practices, language and civilization.

When a person leaves their own culture for another they can experience culture shock. This can occur even when the differences are subtle, such as from one state in the USA to another. Accents, expressions, food traditions and clothing will differ, resulting in insecurities. When an entire group emigrates to a new country or environment it can result in culture clashes, where each thinks they are right and the other wrong. Learning to coexist with others different from yourself has challenged mankind for thousands of years.

What cultural differences result in problems where you live? What problems exist in the world today because of misunderstandings and intolerance?

4. Have you ever been in a situation where you were entirely dependent on someone else in order to survive? Were you comfortable with the situation? Why or why not?

5. What are some situations where you might have to take action based on instinct instead of knowledge or experience? Where do instincts come from? Some theories state that the memories of your ancestors are stored in their DNA and passed on to you. This is one possible reason why birds know where to migrate and a potential explanation for various other animal behaviors. What useful skills might you have inherited from your parents or ancestors? Artistic talent, math or music ability, and physical traits are a few possibilities.

Chapter 2 *(Visions)*

1. Early psychological and psychiatric studies have addressed the source and meaning of dreams. Why do you dream? Have you ever had a dream that was a premonition of future events? Dream symbolism is unique and their meaning seldom obvious. Even colors have specific interpretations. Have you ever had the same dream more than once? This is called a recurring dream. What do you think it means? Why are dreams necessary?

2. Premonitions and psychic ability were once dismissed by science but are being studied today in an attempt to discover how they work and why. Scientists such as Dean Radin and several others study the human consciousness and its abilities that currently do not have any scientific explanation. While they have not identified how psychic phenomena operate they have done statistical studies that show when something goes beyond simple chance. Similar studies have been conducted regarding the practice of astrology by a scientist named Michel Gauquelin. Many scientists reject these subjects and studies because they cannot be proven mathematically or by experiments which are repeatable. History has shown, however, that many of these subjects that were at one time rejected by mainstream science eventually were accepted as the evidence for such increased or technology developed which was able to detect such phenomena. Maintaining an open mind and investigating the evidence for such subjects is the best approach rather than making assumptions that may later prove false.

3. World history is filled with individuals and political forces that wanted to use or control others. Examples include Adolph Hitler, Joseph Stalin, Benito Mussolini, Napoleon, Attila the Hun, Genghis Khan and the Holy Roman Empire to name a few. These entities initially gathered numerous supporters yet eventually failed. Consider what motivated those who wanted power and control as well as those who fought such efforts.

4. Have you ever had a strong impression to do or not to do something? Did you heed the warning? If not, what happened, if anything? If it were to happen again what would you do?

Chapter 3 *(The Think Tank)*

1. Information gathering takes place largely through our five senses, i.e. sight, hearing, touch, taste and smell. When any of those senses are impaired, such as someone who is blind or deaf, the other senses are sharpened to compensate as much as possible. Sight allows you to not only see the world around you but is key to skills such as reading and observing another person's expression and body language, offering another level of information beyond what they are saying. How a person smells provides information as well, whether it is expensive perfume, an athlete after performing a physical feat such as a marathon, or the smell of garlic from their native diet. A handshake likewise tells you something about a person through your sense of touch, whether it is limp, cold and sweaty or firm and confident. Taste can bring pleasure or displeasure and provide information regarding whether or not food will taste good or is spoiled. But what about other senses such as instincts or psychic phenomena? What are they? Does everyone have them with only a few accessing them? Or is it their imagination?

The collective consciousness is a term used to refer to the overall mental state of humankind, the cosmic soup of mental energy emitted by every living person on Earth at any given time. It's interesting to note that sometimes scientific discoveries occur simultaneously in two different locations involving two or more individuals. One example is the "discovery" of the mathematical technique known as calculus which was invented in England by Sir Isaac Newton (1642 - 1727) as well as a man in Germany named Gottfried Leibniz (1646 - 1716.) Social ideas and themes predominate different eras, imbuing them with a personality of their own.

In modern times a man named Roger Nelson has conducted experiments using random number generators which tend to change in character when significant events occur or are about to

occur, indicating a change of energy, for example around September 11, 2001. The Web-bot is another experiment which collects keywords from the internet and can indicate what many individuals are thinking or talking about and has been used as a predictive tool for world events. These theories are controversial and not believed by everyone since they are yet to be conclusively proven. However, proving something of this nature is difficult due to the lack of a scientific theory that predicts not only the behavior but the mechanism through which it is conveyed.

The concept of the Think Tank in this story theorizes that a crystal with certain properties could possibly collect and amplify thought waves but this is pure science fiction speculation. Nonetheless, crystals have been an important element in communications since the invention of the first crystal radio.

2. Have you ever gotten to know someone who you initially thought was "weird?" It's natural to be drawn to people who are like you but they will not be able to stretch your horizons like those who are not. Fear of the unknown, including people who seem strange, is natural, but like most fear, worth the effort to overcome. In particular, consider those who are handicapped or different from you in a way such as mental or intellectual. One example is those with Down's Syndrome. There is a wide range of abilities covered by this genetic problem from those who can function almost as well as someone considered normal to those who have great difficulty with the simplest tasks. However, anyone who has ever known one of these individuals has recognized, they are nearly always happy. Their limited awareness shields them from most of the troubles of the world, much as a small child is usually unaware, allowing them to entirely embrace the present and whatever they are doing. They are curious about simple, everyday happenings and can teach you to embrace the many things you have to be grateful for in your life. Volunteer work with various organizations who help these individuals can be very rewarding, such as helping with an activity such as Special Olympics.

Another example is those with autism or a form of that condition known as Asperger's syndrome. Again, there is a huge range of this affliction from those who function within "normal" range to those who are entirely in a world of their own. Many have incredible abilities, particularly in math, and an ability to synthesize information in an amazing way. They see the world through different eyes, yet it is the same world we all live in which makes it all the more interesting to see it in a different way.

Yet another example is those who have full mental capacities yet are handicapped physically, either because of a birth defect, disease or accident. These individuals will be much like you other than their physical disabilities. How they compensate for their limitations and view life can be very enlightening for those who take such a simple thing as taking a walk for granted.

Chapter 4 - *5 (Plans & The Fault Tree)*

1. What do you worry about? It has been said that worry is a waste of perfectly good creativity. Humans can typically only think consciously of one thing at a time and if you're fretting about something that will exclude thinking about anything else. Much of worry concerns things which will never happen, which is the worst case of wasted energy. While it is always good to have common sense, take proper precautions and plan for life in general, worry in the form of fretting is generally unproductive. If nothing else, it distracts you from the

positive side of things and how to achieve important goals. Optimism or thinking on the bright side of things is more productive and conducive to energy and enthusiasm that being consumed by doom and gloom. In the book, "Infinite Possibilities: The Art of Living Your Dreams," author Mike Dooley admonished his readers to not worry about "the cursed hows." He claims that focusing on your goals and what you want doesn't require lots of worrying with regard to how you'll get there. He promises that as you visualize where you want to go that ideas and guidance will come your way in the natural course of things which you simply have to follow like stepping stones. Maintaining a sense of wonder, hope, faith and a firm belief in yourself will naturally lead you to your destination.

2. Physicists today believe that there are numerous other dimensions besides the four we are aware of, in other words three dimensions of space and one of time. One dimension is represented by a single point, such as the period at the end of this sentence. Add a dimension and you have a line or flat plane of existence. With another dimension you can define a physical object you can hold in your hand. Time relates to where that object may be at any point in time. Yet current theories such as the one known as String Theory, suggest there may be many others which we cannot see, yet are not far away. While these theories are often mind-boggling, pondering what they could mean is a good mental exercise for your imagination. Spiritual beliefs commonly testify of another dimension of existence and have for thousands of years. The fact that science is starting to catch up with what spiritual leaders have been saying all along is certainly food for thought.

3. What do you think it would be like to live on Mira III where everything is mostly under control? What would be the advantages and disadvantages of such a culture? Self-control is something to strive for, whatever your age happens to be. We can control our thoughts, if nothing else, but this is not always easy so it could be advantageous to have a little help. Learning to delay a response is possible but takes practice as well as discipline. Some people are naturally more patient than others. If you have a temper you may find yourself provoked to anger in a blinding flash of adrenaline that puts you immediately into fight or flight mode. This take a lot of mental energy and practice to subdue and usually takes a lot more effort than counting to ten, though that is a good start. Think about what you would like to control better and consider whether you would like someone to do that for you or whether you prefer to make all your own decisions.

4. Building a fault tree is one time when thinking about everything that can go wrong is a positive thing. As part of planning it helps assure success as you specifically consider all possibilities and define a way to prevent, work around or deal with the situation. This is a technique that was used heavily at NASA to assure they didn't miss anything. Fault trees were used to identify potential hazards and how to control them, which were then documented on hazard reports. In some cases there may not be a control in which case the risk has to be accepted yet avoided as much as possible. This was contributed to by the quality of the component which assured it was designed and manufactured to appropriate standards as well as its reliability, which was a probability measurement of how long it would last before it wore out and failed to function properly. Think of an item you're familiar with such as a bicycle, toaster, lawnmower or some other thing that has the potential to hurt you in some way then make a fault tree defining what those hazards are and what would cause them.

Chapter 6 *(Prisoners)*

1. Numerous people have been clinically dead then been revived by medical technology. These individuals typically describe similar experiences regarding what it was like while they were "dead" or out of their body. In fact, these are often called "out of body experiences" or OBEs. These experiences are particularly interesting within the context of various religious views regarding the spirit and life after death. Do you know anyone who has experienced an OBE? How do you feel about their story? Do you think what they experienced was real?

2. Do you have any special talents? A talent is usually described as something one person can do much better than others. In many cases this derives from the fact that the person loves a particular activity or subject and thus spends a lot of time practicing, such as in dance or a sport, and/or learning about it. Thus, most talents are developed and result from a person's love of something. Some are born with an obvious and rare talent, such as the ability to play a musical instrument without ever having had any lessons or instruction but this is very unusual. Even those who are considered extremely talented in some area usually spend many hours practicing so just because you have a talent doesn't mean you won't have to work at it.

Chapter 7 *(Release)*

1. When you are afraid or nervous you experience various physical sensations. Sweating, shaking, brain fog or racing thoughts are just a few that occur when adrenaline surges through your bloodstream along with various other stress hormones. This reaction is essentially the same whether you are face to face with a rattlesnake or an algebra exam. The latter is a condition known as *test anxiety* and afflicts students of all intelligence levels. Ironically a bad case of test anxiety is likely to compromise your performance. The first step is to identify the cause which is usually fear of failure which will result in bad consequences. However, it's unlikely that it's a matter of life and death. Self-help books on the subject are available which can help you understand why you are so intimidated by exams with counseling an option as well. Learning to control anxiety in situations that are not life-threatening can help you eventually learn to maintain control in those that are.

2. What is one way to prepare for a critical situation? Of course mental preparation is important but even more so is knowing what to do. Those who make a living in crisis situations such as policemen, firemen, Emergency Medical Technicians (EMTs), healthcare personnel and those in the military go through long periods of training to prepare them for as many potential problems as possible. With training many procedures become automatic in that they don't require conscious thought. These individuals can enter a "zone" where they respond according to their training and avoid fear or confusion with regard to what has to be done. This is the purpose behind fire drills as well. When something becomes routine and you know what to do in a given situation are less likely to panic. What are some situations you could train for? It might be helpful to interview someone such as an emergency responder and ask how they have learned to suppress their emotions and fulfill their responsibilities while under pressure.

3. Why do you think that doctors often will not treat their own family members? No matter how well-trained or competent a medical professional is suspending judgment, retaining objectivity and controlling emotional responses is more difficult when the patient is a person you care about. This can induce nervousness and impair decision making and thus compromise the ability to take appropriate action.

Chapter 8 *(Complications)*

Murphy's Law states "Anything that can go wrong will go wrong." Do you think this is true? How do worrying and negative thoughts influence your actions? What's the difference between worrying about something going wrong and planning for something to go wrong? Worry usually means that you're fearful about something, which can induce anxiety symptoms discussed above. This can compromise your ability to think clearly. When you have a plan you can feel confident that you can handle any contingency, maintain mental clarity and not waste energy or adrenaline. It has been said that worry is a waste of creative energy. What does this mean? Many things people worry about never occur, thus it is often no more than a product of their imagination. It also has a negative spin that the outcome will be bad. Focusing on how to mitigate a problem restores a sense of control. Then you can develop procedures that you can train for and then respond in a logical, confident manner.

Chapter 9 *(Waiting)*

1. Why do you think medical technology failed to bring 'Merapa back to life? Why could Win bring him back?

2. What do you do when you need the answer to an important question? Do you "rack your brain," research the issue, or find a quiet place to ponder what the answer could be? Which do you think is most effective? Why?

Chapter 10 *(Recovery)*

1. If you were a doctor with two patients of the same age and general physical condition with the same disease but one was unhappy and lonely and the other was happy and surrounded with people who loved him which one do you think would be most likely to get well? How does your mental state affect the way you feel physically? What do you do to cheer yourself up or do you count on other people to do that?

2. Name some things you know are real but don't yet have scientific explanations. Do you think that science will eventually uncover the reason for everything, including life itself?

3. Throughout history both science and religion have been right sometimes over the other as well as wrong. Sometimes religion turns a deaf ear to scientific theories which have been well-proven and science often ignores or vilifies phenomena it can't explain. What is the basis of their respective attitudes?

Chapters 11 - 12 *(Politics and Alliances)*

1. What does the expression "No mistakes, only detours" mean to you? How can it help you learn from experience and progress?

2. Another expression to ponder is "It's not what you know but who you know." What are the positive and negative results when this happens? How can you use that principle in a positive way? Is it wrong to advance yourself by calling in favors? Why or why not?

3. Is Governor Woeyel's philosophy of government liberal or conservative? What are the pros and cons of each?

4. Many of today's technologies originated as military applications. One example is the GPS (Global Positioning System) satellite network which originated for military surveillance activities and has now been released for civilian use. Even space exploration began with military motivations. When President Dwight Eisenhower created the National Aeronautics and Space Agency he wanted it to be a civilian agency, not one run by the military. Nonetheless, it was the Cold War back in the 1950s that motivated the United States to get to the Moon before the Russians. Why would the Moon make an important outpost?

5. If you could increase your knowledge and intelligence by simply entering a certain room what would be the first thing you would want to know?

Chapter 13 *(The Miran Connection)*

1. Have you ever been reunited with someone close to you from whom you'd been separated for a long time? What surprised you the most
about the reunion?

2. Why is it important to maintain proper appearances and avoid situations that can be misinterpreted? Why is it risky to draw conclusions based on appearances alone?

Chapters 14 *(Negative Spikes)*

1. What can you tell about a person from what they read, watch on TV, or the games they play?

2. If thoughts become things what effect could good ones have on their surroundings? What about bad ones?

3. Have you ever tried to learn another language? What are some of the other ways that people communicate? Did you know that during World War II the Americans used Native Americans to communicate over the radio so that no one would understand their messages? The Navajo language was spoken only with no writing associated with it and limited to America, making it nearly impossible for foreign powers to learn the language or have access to it. Not all languages have a written component and some are not spoken, such as American Sign Language but they are all intended to allow communications.

4. Of similar interest is the Rosetta Stone which was discovered in the town of Rashid in the Nile Delta of Egypt in the year 1799. Literally a stone, it contained the text of a decree made by King Ptolemy V in 196 B.C. in three languages, the lowest form of ancient Greek, ancient Egyptian hieroglyphs and Demotic, which was a form of Egyptian used primarily for administrative and documentation purposes. Since the text was nearly identical and scholars were familiar with ancient Greek, it enabled them to understand Egyptian hieroglyphs and open the way to their translation. In other words understanding an unfamiliar or foreign language requires a reference point whether it's an object to define the word or establishment of some other commonality. Some languages such as those known as the "romantic" languages which are those derived from Latin as the language of the Roman Empire have the same root. This

applies to French, Italian, Spanish and Portuguese as well as some English and German words. They are often pronounced very differently but recognizable when written as having the same origins. For example cat (English), katze (German), and chat (French) all derived from the Latin version, *cattus*. The Rosetta Stone can be thought of as the antithesis of the Tower of Babel story in the Bible which describes the confusion of the prevailing language at the time into several different dialects, preventing the people from communicating with each other.

Chapter 15 (*Delta-Sub-Q-Alpha-Prime)*

1. What are some of the reasons that the habitable planets in an intergalactic society would employ space stations as points of entry? First of all, intergalactic spaceships would be extremely large and therefore heavy. In order to escape from a planet's surface into space requires that a vehicle go at least as fast as the planet's escape velocity which depends on its gravitational strength. Current technologies employ rockets which require a lot of fuel to acquire that speed which is why they are large and usually employ different stages which are left behind as the fuel is used up. At the present time science has not determined how to neutralize gravity because they don't actually know how or why gravity works. Advanced civilizations on other planets, however, could have figured this out and employed it into their transportation. In that case, landing and leaving again would not be a problem. However, if a planet allowed all vehicles to land at will they could also be invaded by hostile forces. There is also the possibility of contamination from other worlds which could be lethal for its inhabitants, plants or animals. Thus, coming in through a central point provides greater control of both a social and health-related nature.

2. With the advent of advanced electronics robots have been developed which can perform a variety of tasks. They are used in manufacturing to perform routine and predictable tasks and can also be used as advanced instruments which allow human operators to do more than they could unassisted. Remote control via radio waves allows the operator to be at a substantial distance away, often to maintain a safe distance from hazardous environments. Robots are limited, however, and cannot make decisions other than those that are programmed into them. People can think and synthesize information based on experience which allows them to make real-time decisions in situations they have not previously experienced. Artificial intelligence refers to the ability of a robot to think and draw conclusions and gather experience.

3. A common algorithm or sequence of commands in computer programming in that known as an "if-then" statement. It tells the robot or devise "if" this is true, "then" take a specific action. As an exercise thinking like a machine, try writing down all the necessary steps for performing a simple task such as making a sandwich or getting ready for school. The next time you play a computer game think about the commands operating in the background that direct the game to behave as it does. Better yet, write down an algorithm for one of the most common actions using "if-then" statements.

4. A "synchronous orbit" is one where an object such as a satellite is always over the same place as seen from the planet. Communication satellites, including those that provide television and internet services, are in such an orbit. Of course they are not standing still. Rather, the time it takes them to make one orbit is 24 hours, the same amount of time it takes for the Earth to complete one rotation. They are therefore moving at the same rate which makes the satellite appear to remain in the same location. The amount of time it takes a satellite to complete one

orbit depends only on how far it is above the Earth. Its size or mass does not matter. Thus, whether it's a space station or a small communications satellite it will be at the same distance which is approximately 22,300 miles (35,900 kilometers) above the Earth. A geosynchronous orbit is also known as a geostationary orbit. It is circular but the satellite will be perturbed by the Moon from time to time which will require adjustments at the ground station or adjustments to the orbit by onboard thrusters.

Chapter 16 *(Bryl)*

1. What are some of the advantages of international cooperation in scientific research? First of all, combining the knowledge of scientists who received their training in different locales creates a synergistic environment where additional discoveries can evolve. Intellectual and cultural diversity stimulate creative thinking and seeing the same phenomena through different eyes. Secondly, if several countries cooperate in scientific endeavors it is less likely that one will advance faster than the others and thus achieve technological dominance which could ultimately result in war. Thirdly, many scientific and engineering projects such as the International Space Station are expensive endeavors. When several countries work together with each contributing financially the combined resources allow the group effort to pursue larger projects than either could alone.

2. What are some of the pros and cons of consensus? When everyone agrees it's easier to focus on a single goal or target. Otherwise everyone could be going off in another direction, literally or figuratively, and compromise the group's objectives. However, if everyone always agrees creative problem solving can be inhibited or nonexistent. Worrying about always obtaining others' approval can squelch ideas before they have a chance to mature. Breakthroughs typically come from unconventional approaches so honoring individual and different opinions are important, too.

Chapter 17 *(Intuition)*

1. How much can emotions be trusted? What is the difference between emotions and intuition? Emotions are actually a physical response to some sort of stimulus, sometimes positive and sometimes negative. Depending on your personality, some people are more affected by emotion than others. Emotions can be joyful or painful and drive conclusions and decisions that are not always factual. If a person feel threatened in some way then their sense of security is at risk which can activate the "fight or flight" response. The important thing is to recognize when your thoughts have an emotional basis. Talking through your feelings with someone you trust can help put them in the proper perspective and help you avoid making bad decisions not based on fact. Intuition, on the other hand, derives from your subconscious instead of your emotions. There is a tremendous amount of information stored in that part of your brain that you cannot access.

For example, years ago they conducted an experiment where test subjects were placed in a room with a ceiling covered with acoustical tiles that had numerous holes in them. They were asked to count the holes and report their answer. Most people counted the holes in a few tiles then multiplied it by the number of tiles to get an estimate. Then they hypnotized the individuals who were then able to effortless tell them the exact number of holes. A similar experiment involved reading a newspaper where they were told to focus on one particular story,

which they were asked about. In spite of only reading that one story, when they were hypnotized they were able to convey every story on that page of the paper in vast detail. Thus, you are constantly picking up on all sorts of information at a level beyond your conscious mind. Hypnosis is one way for accessing your subconscious where all this information is stored. Sometimes your subconscious will process this information and draw a conclusion which it conveys in the form of intuition which will usually be correct. It is not always easy to distinguish between feelings based on emotion and a feeling evoked by something in your subconscious. Learning to tell the difference is important, however, since emotions are often an inaccurate representation of truth while your subconscious can be a powerful ally.

2. Electromagnetic radiation is the technical term for what we know as light. However, the visible spectrum is only part of the radiation included in this type of energy. Each color represents a different frequency and wavelength as well as energy level. Not all radiation can be seen, however, like microwaves and radio waves. A microwave oven cooks food because the energy is converted to heat as it meets resistance. Infrared radiation, also at the low end of the spectrum, is recognized as heat. You may also be familiar with how the world looks through infrared goggles, where everything has a green cast. On the other end of the visible spectrum is ultraviolet, which cannot be seen. It is a shorter wavelength and higher frequency which can cause damage to cells and is also responsible for such everyday things as sunburn. Sunscreen blocks these rays and thus protects your skin. Xrays such as those used by the medical profession are stronger still and can cause even more damage in large doses. After that come gamma rays, which are the most dangerous, and are emitted by the Sun. Fortunately for us, Earth's magnetic field and ozone layer protect us from them.

To understand why remember that we're talking about *electromagnetic* radiation which derives from an *electromagnetic* field. Electricity and magnetism not only go together but are inseparable. The Earth's magnetic field is caused by the planet's iron core being rotated, which actually creates electricity. Rotating magnets are common in motors and electricity in turn creates a magnetic field. This is why power lines, particularly large transmission lines from power plants, can cause radio signal interference as their magnetic field disturbs them. Light is made up of tiny particle-like units known as photons which have energy related to their wavelength. Photons originate at the atomic level and can also be absorbed in a similar manner. An influx of photons from the Sun is thus visible in the form of auroras at the North and South Poles. Their color results from their interaction at the atomic or molecular level with Earth's atmosphere and demonstrates their change from high energy gamma rays to lower energy emissions in the visible spectrum.

3. Encryption refers to scrambling a signal or message into a form that disguises it so that no one else can read or understand it. Of course both parties, the sender and receiver, have to understand the encryption scheme so it can be translated. This is usually done mathematically using a technique known as a matrix. The letters and numbers are scrambled according to a certain pattern which the matrix can scramble and unscramble. This is more sophisticated than a simple scheme such as assigning numbers to letters such as A is one, B is two, C is three, and so forth. The consistency in that method makes it easier to translate. With a matrix, however, the letters will not always have the same value and be impossible to decipher. Secret codes have been used throughout history using a variety of different mechanical devices that functioned similar to the matrix. In modern times, computer technology has facilitated a variety of techniques for encoding messages.

Chapter 18 - 19 *(Grounded Out; Home)*

The definition of *serendipity* is to make fortunate and unexpected discoveries by accident or is sometimes also referred to as an unexpected delight. Recount any such experiences you've had such as meeting the right person at exactly the right time t help you with something or finding something in a lucky and surprising way.

Chapters 20 *(Operations)*

Have you ever started a project without fully understanding what was required to finish it? Did you get discouraged and quit or do what was required to reach your goal? Usually when you give up at some point you will regret it with it often impossible to go back and resume the endeavor. On the other hand, when you persevere and keep trying, regarding of how much effort it may take, you will learn new skills as well as patience which will help you throughout life. An optimistic "can-do" attitude is always helpful when tackling a difficult task. It's important to know your limitations, however, and not try to do something so far beyond your capabilities that you are doomed to failure from the start. For example, if you want to compete in a marathon you need to train and prepare a long time in advance, perhaps with the assistance of a good coach or experienced runner. You would start out with the right equipment such as good shoes and shorter distances to build up your strength and endurance. Difficult mental or intellectual tasks should be approached in the same manner, one step at a time and drawing from the advice and experience of others who have already accomplished what you hope to achieve.

Chapter 21 *(Intelligence)*

1. Situational awareness is a term that refers to being vigilant regarding what is going on around you. It is a significant part of military training but also relevant in your life as well. One example is defensive driving, where you watch those around you on the road and anticipate what they might do which could cause a hazard along with what your response would be to avoid an accident. Another example is traveling in a foreign country where there is a high incidence of theft so you keep close guard on your possessions. Being oblivious to your surroundings can be dangerous as well if you are hiking in an unfamiliar area, don't know what kinds of wildlife you may encounter, temperature variations, challenging terrain, and so forth. Give an example of a situation where knowing all the facts would be essential to your well-being in a defensive manner.

2. The other side of situational awareness is using it in an offensive manner to your advantage. For example, if you wanted to go on vacation but had a limited budget, you could find out ways to get the most for your money. You could watch for the best price on transportation such as airfare as well as accommodations such as available hotels, hostels, bed and breakfast inns and so forth. Collecting coupons for discounts on meals, researching where to get the best food for the least money, talking to other people who had already been there or doing research on the web could also help you find the best values. You could find out what activities in the area are available for free and plan a budget for souvenirs as well. Deciding where to go to college is another example where gathering information to guide your decisions will help assure a positive experience.

3. How much can you learn about other people by paying careful attention to what they do and say? How much can you tell from a person's appearance and behavior? What type of person do you feel drawn to versus repelled? Do you know why you react that way? They say "A tiger can't change its stripes" which means people don't change. Do you believe that is true?

Chapters 22 *(Mind Games)*

1. Are you a detail-oriented person or a "big picture" person? What are the advantages of each? What are the limitations? A detail-oriented person can find small flaws or inconsistencies in an item or project plan. However, they may become so caught-up in trying to make everything perfect or solve one specific problem that they lose sight of the goal or vary off-course. A "big picture" person excels at visualizing the end result, setting long-term goals and defining the basic plan for achieving them. However, this person may miss important details and obstacles which could be avoided by proper planning, such as running out of money before it's complete. Thus, when they work together they have a better chance of success. Which one are you? What experiences have you had that demonstrate the strengths and weaknesses?

2. When you want something do you try to do it all by yourself, expect someone else to do it for you or decide who you can partner with to help your or achieve it together? This is another situation where understanding your goal, what is needed to get there, and identifying any help you may require are essential for avoiding delays and frustration as well as assuring success. Usually the more you are willing to do yourself the more likely you are to succeed. Always expecting someone else to do the work or help you out will not only prevent you from learning important skills and lessons but will ultimately fail when there is no one there to turn to. There's an old saying "If you want something done right then you need to do it yourself." While there are exceptions since some things are impossible to accomplish alone, being willing to do your part is an important factor in accomplishing what you want in all phases of life.

Chapter 23 - 24 *(Covert Ops; Intentions)*

1. Think of someone you know whom you consider to be stubborn and opinionated. Now think of someone you know who is patient and always willing to listen, looks first to the facts, and compromises when necessary in a reasonable manner. Which person do you think will be more successful in the long run? Why? Now rate yourself on a scale of 1 to 10 with 1 being willing to listen and 10 being confident that you are usually right. Think about making any adjustments required to optimize the chances that others will share information with you or respect your opinion.

2. Can you always control your reaction to information or certain situations? This is usually a high-order skill that takes years to achieve. When a person feels threatened physically, emotionally or intellectually, their first instinct is usually a "fight or flight" response. In a primitive society this tends to assure survival but in modern culture where so many different situations exist it is not always accurate or advisable. While it is difficult to learn to control that adrenaline rush that triggers this response, you can learn to control what you say in response. If certain situations arise frequently you can figure out in advance how to react and rehearse it, either alone or with someone else. This equates to training which, as noted earlier (Chapter 7,

item 2) can make your reaction a planned one that becomes automatic and assures it's appropriate. Think about past situations where you "lost it" and how you would handle it if it occurred again as well as any you expect to face sooner or later. Practice your response until it feels comfortable.

Chapters 25 *(Unveilings)*

There are lies of omission and lies of commission. Are lies of omission any better than those that are deliberate? What are some of the reasons that people withhold information? When is it justified? When is it not justified? What are some of the risks? How do you react when someone withholds information that you find out later? How does it affect your trust of that person? Sometimes it is easier not to tell something to a person than deal with their reaction. Often it is not a matter of what you tell a person so much as how. This is where tact comes in, the ability to say something in the most uncontroversial manner and avoid getting the other person upset. This particularly applies to criticism.

For example, someone else's behavior may be extremely irritating but you have to be around this person all the time. You want to tell them to quit doing whatever it is, yet don't know how so you keep quiet. However, the anger keeps building up and you feel as if one of these days you're going to lose it and explode. You need to talk to him or her before that happens but don't know how. One technique which helps this type of communication is to use what is known as "I" messages instead of "you" messages. For example, if you say "I feel angry and put down when you talk to me that way," it is likely to have a better result than saying "You really make me mad when you act that way." When you start a statement with "you" it sounds more like an accusation which will trigger a defensive reaction. When you start with "I" and declare your feelings or own reaction you take responsibility for yourself and are more likely to invite the other person to examine their own behavior than be defensive.

Chapters 26 *(The Learning Curve)*

A "learning curve" refers to the time it takes before you fully absorb a concept or how to do a specific task in an easy, non-challenging manner. For example, when you first learned the alphabet and then how to read you went through a period of time when you had to think about it consciously then gradually it became familiar and easy. This also applies to learning math facts, how to play a game or sport as well as any new skill. Are you ever afraid that you can't ever learn how to do something? Have you ever admired someone for their abilities and wished you had them yet doubted you could ever do so? It's important to realize that unless someone is a blatant genius, which is rare, that they learned one step at a time and went through various levels of the "learning curve" before becoming proficient and eventually an expert. Think of something you currently wish you could do. Research what training would be required to do so and approximately how long it would take. If you know someone who is already proficient, talk to them and find out how long it took for them to get to that level. Remember that the desire to do something is often the most important factor. If you want something badly enough you will have the drive and patience to learn, study and practice until you reach your goal, whether it's playing a sport or musical instrument or achieving excellence in a particular field of study such as science.

Chapter 27 (*Questions and Answers)*

1. How well do you accept being wrong about something? Do you argue and deny it, refusing to accept it, or logically examine the facts to determine the truth? How much does your emotional reaction hamper discovering and rectifying any mistakes? The ability to accept being wrong without feeling stupid or incompetent is important to success because everyone is wrong sometimes. Accepting it, being willing to listen and learn, then moving on smarter than before is how you progress in life. Those who never acquire the humility required to admit they are wrong can easily get stuck in various parts of life.

2. Have you ever been pressured into making a promise you couldn't keep? What happened? What lesson(s) did you learn?

Chapter 28 - *29 (Confessions; Treachery)*

1. Have you ever been in a situation where you received "too much information?" Are there times when it's better to not know everything another person is thinking? Why do people withhold information? When is it detrimental? What kind of mistakes can be made when you don't know all the facts in a situation?

2. Are all laws favorable for the average person? Do they always protect people or can they have the opposite effect? What influences affect the making of a law and its enforcement? In the USA large corporations and special interest groups maintain lobbyists in Washington, D.C. to influence laws and regulations. What are some of the pros and cons of such a system? Do you agree they should have an influence or should all laws be based strictly upon what the majority of people want?

3. What causes an eclipse? There are two times every year when eclipses occur but they are not visible everywhere, particularly solar eclipses which are only visible over a narrow path. A solar eclipse occurs when the Moon moves directly in front of the Sun during its New Moon phase and casts its shadow on the Earth below. This does not occur every month because they only line up when the Sun is close to the lunar nodes or where the Moon's orbit crosses the Sun's path, also known as the ecliptic. Lunar eclipses occur when the Moon passes through the Earth's shadow at the Full Moon phase. These are visible over a much larger area since the shadow of the Earth is much larger than that of the Moon. Ancient people believed that eclipses were indicators of ominous events to come. Just for fun, the next time one occurs pay attention to whether something important occurs around that same time.

4. Have you ever missed an important fact? What were the consequences? Usually missing something important occurs when you are distracted in some way. Emotions especially can cloud your thinking and judgment. Remember the importance of knowing the difference between emotions and intuition *(see Chapter 17, number 1 above).*

Chapter 30 *(Disaster)*

Perseverance is an important trait which relates to never giving up. Obstacles and difficulties are to be expected in pursuing any goal, which would never be obtained if you gave up too soon. However, is it ever time to quit, particularly if you are "beating a dead horse?" How do

you know whether you should steel yourself with determination and continue forward or recognize you're wasting your time and cut your losses? When something reaches that point it is important to recognize all you have learned from the experience, even if you didn't wind up where you had hoped. Skills, lessons, connections and experience can always be applied to the next endeavor. Recognizing why the effort failed is important as well so you can learn from it and avoid the same mistakes the next time. Those who have been successful always have numerous failures behind them which are often invisible to those who only see the present. Inventors have a strong appreciation of failures which help them determine how to improve their device. Any effort that turns into a major flop has value as a learning experience, particularly when you learn vicariously from the mistakes of others.