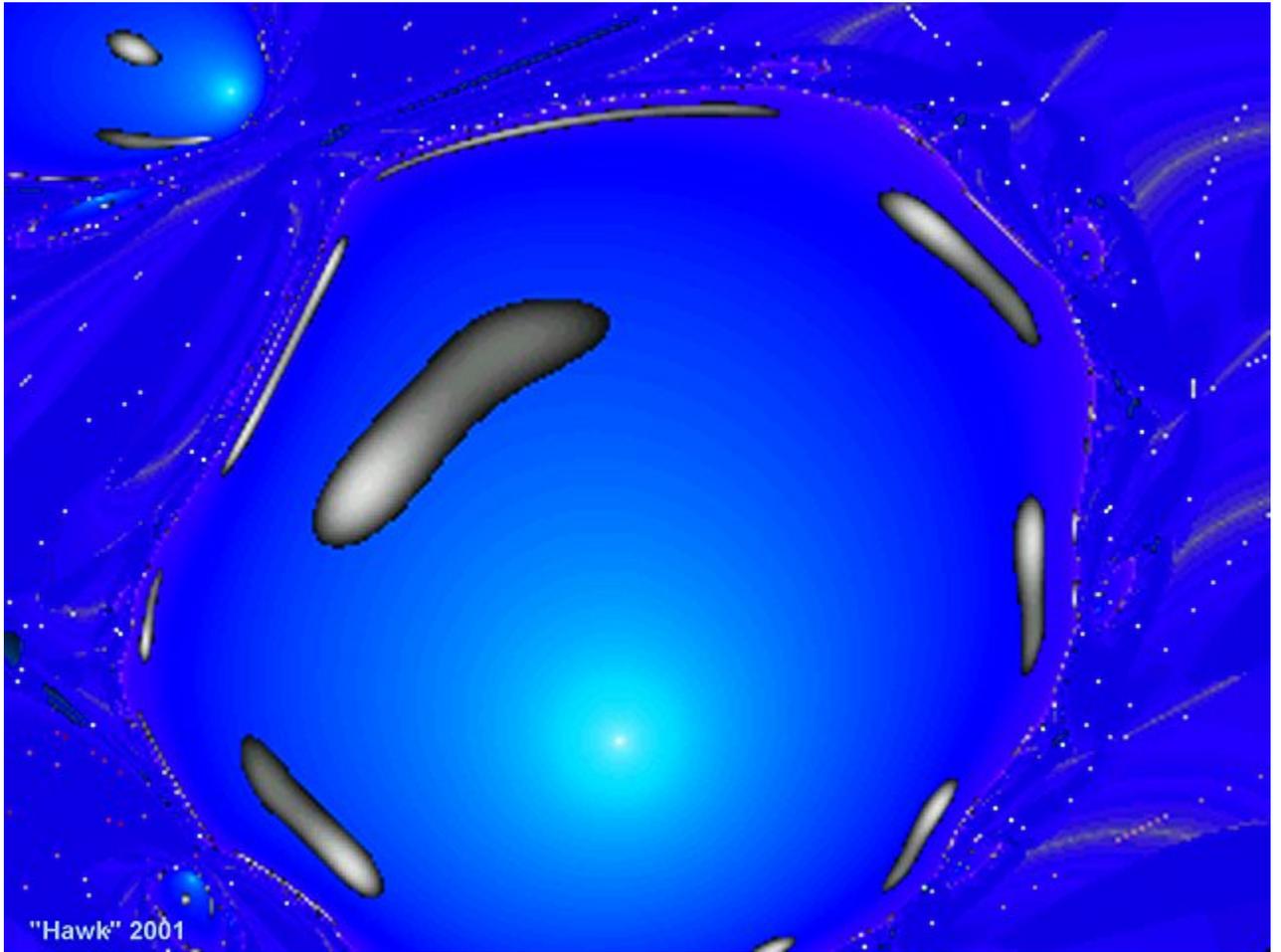


“Space Bugs”



(Hawk, 2001)

Lena Walker
Introduction to Physical Geology
January 2008

“Space Bugs”

Say the word “space bug” and you immediately conjure up an image of a goofy-looking, Hollywood created “creepy crawly.” Nonetheless, the thought of an actual encounter with a “creepy crawly” is disturbing. The idea of a *killer* “creepy crawly” is cause for alarm. The possibility of an *invisible*, killer “creepy crawly” is more than just a little bit frightening. Now contemplate an invasion of an army of *outer space*, invisible, killer “creepy crawlies” and only a fool would laugh – because according to some scientists – it has happened before and it will happen again.

Space bugs? Does it still seem rather ridiculous? Try a word that is probably more familiar to you: Super bug. A more accurate description of the word is virus - a virus with no resistance to any currently known antibiotic and which results in mass destruction of the human population. A pandemic. A plague. Do not kid yourself. This is not “the stuff of science fiction.” This is reality – the world we live in. This type of invasion has the potential to annihilate more people from the face of this earth than any form of terrorist threat imaginable. What makes these space bugs or viruses so incredibly deadly? ***They move with remarkable swiftness and have no cure.***

Before going any further, let’s discuss how this idea – this theory – came into existence. What made someone entertain the notion that we have been attacked by “alien invaders” of the worst kind? What makes scientists think it will happen again?

First of all, it is important to understand that our physical world is constantly being bombarded by cosmic debris. Our layers of atmosphere work as a shield to keep most of the debris at bay so as the debris pummels our planet, it usually burns up and is destroyed before penetrating our atmosphere.

We are generally quite unaware of this cosmic activity unless a chunk of meteor happens to successfully enter our atmosphere and crash somewhere onto our earth. For example, in September 2007, a meteorite fell and hit nearby Lake Titicaca in Peru. Subsequently, approximately 30 villagers who visited the crater shortly after impact reportedly fell temporarily ill, suffering from nausea and headaches. It was decided, after investigation from a team of Peruvian researchers and samples sent to a lab in Lima, that the illness felt by the spectators was from exposure to arsenic fumes. The meteorite’s hot surface had apparently met with an underground water supply tainted with arsenic which caused the noxious gas. (Orozco, 2007)

A side note of added interest is the fact that the meteorite in Peru is a different composition than most. It contains iron, but it is lacking metal fragments, making it a rare rock meteorite. (Orozco, 2007) Yet another example of a rare meteorite is a rock that resembles fool’s gold which crashed into the home of a New Jersey family on January 2, 2007. It is highly unusual because it is a large, metal chunk rather than a chunk of ice or rock. Upon testing, it was found to be magnetic. A stray airplane part was ruled out, but one theory suggested it might be a lost astronomical tool or flotsam from an orbiting satellite that melted as it entered the earth’s atmosphere. One other theory is that it is from the Quadrantid meteor shower that occurs annually in early January. (Pastino, 2007)

Obviously, “space invaders” do exist. Things *do* manage to enter earth’s atmosphere and eventually reach the surface. Based on this knowledge, there are

scientists who firmly believe that every disease known to man originated in space and traveled here using comet dust as the vehicle.

Before we jump into this theory, though, we now need to do a little examination of the medical world. Taking a look back in history, we know that for thousands of years, nobody knew what caused diseases or how they were spread. In the mid 19th century, scientists discovered that some diseases were caused by microbes, called bacteria. Then, 50 years later came the discovery of even smaller disease causing agents – viruses. Microscopes came along in the 1920s-1940s and this invention helped scientists see and begin to understand what they were dealing with for the very first time. (Mega Disasters: Alien Infection, 2007)

Scientists also learned that most diseases are spread by traveling. For thousands of years, geographic barriers such as oceans, deserts and mountains had offered some protection to people. As technological advances were made and people began to travel, natural protective barriers were broken...and diseases began to migrate. (Mega Disasters: Alien Infection, 2007)

Christopher Columbus, in 1492, was one of the first people to introduce a disease by migration when he returned to Spain from the area we now call the Bahamas. Along with the riches of the new found world, his crew also brought back a deadly microbe – the syphilis bacteria – which spread through sexual contact. For the next 5 centuries, syphilis ravaged Europe. (Mega Disasters: Alien Infection, 2007)

Other examples of disease migration include the Conquistador conquer of Mexico. The Conquistador's introduction of smallpox to Mexico was probably the more effective weapon in securing their victory. Captain James Cook crossed the South Pacific 200 years later and nearly annihilated the newly discovered civilizations with the importation of diseases – demonstrating something as seemingly mild as a common cold can wreak havoc on a previously unexposed community.

Scientists learned over time that germs are more virulent when introduced to a new population. Doctors call this “viral naivety.” A population which has no prior exposure to a virus is much more susceptible to devastation and death than a population subjected to prior exposure and opportunity for antibody build-up. In many cases, once a person has a disease and survives, they will not be infected again.

In 1918, the world experienced the most fatal epidemic in all human history. It is this pandemic that many scientists are using as their supporting evidence for comet-borne viruses. It was called the 1918 Influenza and was also commonly referred to as the Spanish Lady because some people believed it originated in Spain. The fact is, even today, no one knows exactly where the virus originated – but theory suggests it originated in outer space. (Mega Disasters: Alien Infection, 2007)

This particular virus is unique from other known plagues for several reasons. To start, it appeared *simultaneously* and without warning in two *different* world regions – Boston, USA and Bombay, India. This is significant because this occurred in the days before air travel. Almost immediately, cases sprang up in Brest, France and also in Freetown, Sierra Leone. Another critical difference demonstrated by this virus was that the disease was disproportionately fatal to healthy, young adults in their 20s-30s. This suggests that exposure was highest among active adults who would be more likely to have exposure to outdoor, potentially virus-laden air. Yet another phenomenal aspect of the 1918 Influenza is the rapid speed in which it spread, from one remote region to

another – without the possibility of direct people-to-people contact. This global pandemic may have killed up to 100 million people and in many cases, death occurred within a matter of hours. Then, seemingly overnight, the virus abruptly vanished in the Spring of 1919. (Mega Disasters: Alien Infection, 2007)

Chandra Wickramasinghe is an astrobiologist from Cardiff University. He is a well-respected and world-renown scientist who has no doubt that the 1918 Influenza and other viruses originated in space. He claims his work not only supports the idea of “space bugs” but also fully supports the theory of panspermia, the hypothesis that life on earth originated elsewhere in the universe. Nearly 30 years ago, he began working with Sir Fred Hoyle, exploring the possibility that life is not confined to earth. Together, they came to the conclusion that, “We are part of a chain of being that goes through the comets to the remotest parts of our universe.” Further, he believes there are an enormous range of microorganisms in the universe and that we, as humans, have evolved from a subset of these microorganisms. (Mega Disasters: Alien Infection, 2007)

Chandra believes the seeds of life were transported to earth by comets 4 billion years ago. During that period of time, both the earth and the moon were being bombarded by comets. Interestingly, the oldest evidence of life on the earth coincides with this timeframe. (Mega Disasters: Alien Infection, 2007)

In 2001 and in collaboration with the Indian Space Research Organization, Chandra launched a balloon into the upper stratosphere, 28 miles above the earth, to collect samples of comet dust. In the dust, evidence was found of bacteria-type cells – “clumps of them” – which show signs of life. Chandra believes this establishes that some viruses could survive even the harshest conditions in space. As a matter of fact, he believes that if a microorganism is preserved in space, in a particle of space debris, it could remain that way for an eternity – until it finds a pathway to flourish within the atmosphere of earth. If this theory proves true, then it could explain the odd patterns of viral infection among the human race. (Mega Disasters: Alien Infection, 2007)

In 2006, NASA’s Stardust Mission successfully collected comet dust allowing astrobiologists to progress one step closer to understanding just what comets are made of. Amazingly, it was discovered comet dust contains carbon, hydrogen, oxygen and nitrogen – the building blocks of life. This was an unexpected find for the larger scientific community and Chandra insists that since the mission was undertaken without any thought to the possibility of finding organisms in comets, the manner in which the dust was collected would not have preserved any living particles even if they had existed. (Mega Disasters: Alien Infection, 2007)

Continuing their studies of the 1918 Influenza, scientists have explored the icy regions of the world in an attempt to unlock the mystery of the virus’ origination. Eventually, the decision was made to seek out bodies buried in mass graves in Alaska with the hope of retrieving preserved DNA from long-frozen lung tissue of unfortunate victims. In 1951, a pathologist named Johanne Hulton was able to retrieve lung tissue from the icy tundra. Unfortunately, being limited by the technology of that time, he was unable to culture the virus. However, in 1995, a molecular pathologist named Dr Jeffrey Tobenberger tried again. Although equipped with more advanced technological tools, success was not his for an additional 10 years. Finally, though, success was won and he was able to confirm that the 1918 Influenza had originated with birds. (Mega Disasters: Alien Infection, 2007)

Dr David Morens, an epidemiologist from NIAID noted, “We’ve never seen a human influenza virus that *hasn’t* ultimately come from birds. However, it’s not like any bird virus that we’ve ever seen before.” Apparently, the 1918 Influenza is even more unique in that it caused what doctors refer to as an “immunological storm” within its victims. The immune system was in such hyperdrive that it did *too good* of a job and ultimately did more damage than the virus itself and caused the infected person to hemorrhage to death. (Mega Disasters: Alien Infection, 2007)

Another example of a possible “space invader” is SARS. This particular type of virus is typically found only in the respiratory and digestive tracts of mammals and birds. It was not surprising to scientists that SARS made its debut in China because Asia is the epicenter of many viruses. The conventional reasoning is that people live in closer proximity to poultry and water fowl. Chandra, however, believes differently. (Mega Disasters: Alien Infection, 2007)

Chandra believes that the first point of entry of a virus into earth’s atmosphere has to be East of the Himalaya mountains. The Himalaya mountains are the tallest mountains in the world and as such, they virtually “poke a hole” in the earth’s atmosphere and expose its upper most portions into the stratosphere above – where the believed virulent comet dust can be found. Consequently, the dust then has a point of entry into earth’s atmosphere. As the dust rides the air currents, the first species it encounters are birds. Chandra states, “They sample the earth’s atmosphere more extensively than any other creature on our planet.” Therefore, according to Chandra’s theory, it makes perfect sense that birds are the first species infected with viruses. Many mammals interact with birds in the wild, so again, a viral interrelationship is no surprise. (Mega Disasters: Alien Infection, 2007)

If a virus can “ride” into earth on comet dust, is it possible that with our methods of space exploration, we may inadvertently introduce a “space bug” into our atmosphere? Initially, scientists had been concerned about this possibility for some time; however, during the late 1970s, all concern dissipated when the Viking Probe to Mars seemed to indicate there was no life on Mars and scientists, as a group, breathed a sigh of relief. Since Mars was always thought to be the planet with the most likelihood of having had life and the Viking Probe indicating there was none to be found, concerns were dismissed. However, in 2006, astrobiologists began to seriously rethink the possibility of inadvertent infection because newly formed gullies, not apparent in 2000, were now found on Mars – indicating a possibility of liquid water. This finding was *particularly* significant because, as Maria Zuber from Earth Sciences at MIT says, “On earth, everywhere that we see water, we see life. So if one is trying to find life, as we know how to recognize it, the best place to look is where the water is.” (Mega Disasters: Alien Infection, 2007)

NASA has set its sight on Mars once more and on collecting soil samples. Currently, NASA is working on instrumentation that could be sent to and remain on Mars to look for signs of microbial life – past or present. There are some scientists who would prefer to have those samples physically returned here to our planet – but there is a lingering concern of unintentionally bringing back a replicating microorganism which could then have the possibility of creating a doomsday scenario among our living population. (Mega Disasters: Alien Infection, 2007) It rings of, “The Andromeda Strain” – but without the thrills of Hollywood and the proverbial happy ending.

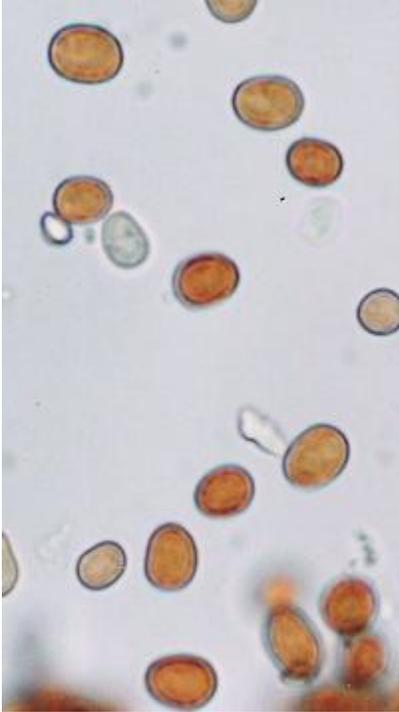
The potential of mass infection, whether from the sample(s) or the method used to return the samples to earth, is a reality that requires attention from the scientific community at large. NASA plans to use the highest level of quarantine and containment possible and it also has safeguards in place in the event the spacecraft should suffer malfunction and crash upon its return. (Mega Disasters: Alien Infection, 2007) However, what if the “alien invasion” is not under the influence of NASA, but is comet dust-borne instead?

This is a very valid concern. In 2007, astronauts took into space and brought back an often fatal-to-humans bacteria known as *Salmonella typhimurium*. The bacteria had been sent up in the space shuttle and then brought back to see if there were any genetic mutations. Upon the return to earth, scientists injected the bacteria into mice. They found the bacteria had indeed mutated – genetic sequencing showed that 167 genes and 73 proteins had been altered which resulted in quicker and more frequent death in the lab rats. (Stemp-Morlock, 2007)

Thus, even though NASA has safeguards in place to quarantine and protect us from the supposed remote possibility of introduction to a deadly alien microorganism related to their space missions – the truth is that nobody knows if the safeguards are good enough. The best we can do is hope that public health officials spot the trends that would surface in enough time to put the medical community and the investigative teams of scientists on full alert and in high gear. The polio epidemic of the 1940s is still recent enough to remind us of how populations react in fear and chaos when panic sets in – people turn against one another no matter the family ties and self-preservation becomes the prevailing interest. Hurricane Katrina was also a demonstration of how ill-prepared we are as a society to deal with large-scale crises.

What about things that fall from the sky that we can see but that scientists cannot yet explain? Is this cause for concern or alarm?

On July 25, 2001, reports began filtering in – red rain was falling all over India and within a 10-day span, over 50 tons fell from the sky. The rain continued to fall sporadically over a 2-month time span; however the majority of the red rain fell during those first 10 days. There were reports of other colored rains which were thought to be rains colored with sand particles, fungus spores and other natural contributors. Interestingly, the red rain has yet to be properly explained. They appear to be red cells without nuclei. Even after 4 years, they have shown no sign of deterioration or decomposition. While they have no nucleus – the core DNA compartment of all known plant and animal life, they *can* multiply in extremely high temperatures. In addition, the cells appear to be primarily made of carbon and oxygen, but also contain silicon, iron, sodium, aluminum and chlorine. (World Science, 2006)



(World Science, 2006)

A current viral threat that has epidemiologists extremely concerned is H5N1. They know this virus has jumped species, from birds to humans, and the mortality rate is over 50% of its victims. Apparently, it has also, in a few remote cases, jumped from human-to-human and this is what is being watched closely. (Mega Disasters: Alien Infection, 2007) The origination of this virus is still unknown, but Chandra believes this one comes from outer space, as well.

Again, there is no concrete scientific proof as to how H5N1 was introduced to our earth and even if it were, that a pandemic looms on the horizon. Yet, if we were to theorize such a scenario, we can draw a path from beginning to end with relative ease.

Typically, dust-like debris from comets is pulled to earth's surface by gravity and this process usually takes decades. However, every 11 years, the sun enters into a sun-spot cycle and the charged, energetic particles lead to the creation of very strong electric fields which pull the comet dust to earth's surface at a far faster speed. Birds would be the first to inhale the virus where it would be contained within their digestive tract. The virus would eventually mutate and could then jump species. (Mega Disasters: Alien Infection, 2007)

The path of infection would virtually explode due to the high volume of human travelers every day. Additionally, it would be just a short matter of time before a person, feeling quite ill, would make an appearance at a local hospital – full of other people with probable degrees of immunological compromise.

It is critical to keep in mind that up to 30% of the population could be immediately infected and affected – which could heavily impact hospitals and the availability of medical staff. In addition, critical medical equipment is already foreseen to fall dangerously short – meaning only the strongest or those deemed most likely to survive will have access to life-saving protocols.

One cough...one sneeze...and the human population is in serious trouble. Precious time will pass before doctors recognize they are dealing with a pandemic in its infancy – and time is the one thing on nobody's side. Every minute is crucial. Unfortunately, and far too quickly, it will be too late. A worst-case pandemic scenario will have been born and within weeks, unimaginable death and devastation will be world-wide.

CONCLUSION

Every aspect of this topic and the research involved was something that somehow tied in to what we have been learning in our class. Space, water, earth composition, cosmic debris, chaos in the universe, the sun, gravity, dust particles...even the end of the world. Many times it has been expressed the delicate balance between life on earth and the relationship with the universe and I felt this topic demonstrated this so well. I also was intrigued by the mystery of the “unknown.” As a scientific community, we have made leaps and bounds and yet, we know so very little. I find this to be quite humbling.

I did not have an opinion of “space bugs” prior to this paper. If anything, I suppose I would have said that I sure hoped they did not exist – yet I had a vague notion of “trouble on the horizon” when I read the article on MSN.com a couple of months ago about the virus the astronauts and taken into space and then brought back and its subsequent, more dangerous, mutation. I thought it was a little scary and hoped they knew what they were doing! Interestingly enough, just over the weekend there was another report by MSN that there is a “spy satellite” that is “dead and out of control” and hurtling toward earth. They are not yet reporting where it might land. They did say “authorities” were concerned – not just about classified intelligence information being confiscated by the “wrong people” – but by the fact that they do not know if the dead satellite will be bringing a “space bug” with it. Oops!

When I started investigating just how serious the topic of “space viruses” might be, I really had no idea what I would find. The “powers that be” do tend to tamper down information – but I knew that if my sources were National Geographic and other reputable scientific institutes – I was on to something good. You got me even more interested when you said your science magazine had an article about a space bug! I was 100% sure then that I had selected the right topic for me.

One of the first articles I came across was the “red rain.” Red rain that is not red “rain” at all – but is actually some sort of space microbe that, even after four years, can STILL reproduce – and in extreme temperatures, as well. By the time my History Channel DVD arrived featuring the theory of comet-borne viruses, I was so enthused to watch it. I watched it half a dozen times or more and then had my family watch it, too. It was spooky – yet so very interesting! Again, when I was researching the “red rain” and other “space phenomenon” – I came across Chandra's name quite often – so obviously he is still a much outspoken and respected member of the scientific community – which, in my mind, led further credence to the validity of my topic.

I would have to say that I am very open-minded when it comes to anything out of the ordinary. I think what surprised me more than anything about this topic was not so much the *possibility* of a space virus – but the fact that they think it has **already** happened numerous times on this planet – and so will inevitably strike again. That, too,

is hard to really digest because when you think about it – those “big, bad, ugly things” have only happened in the far-distant past. Too, we have had many “false alarms” in recent years – YK2000, etc. We hear so much about “the bird flu” that we tend to disregard the warnings. I know I certainly felt that way about West Nile until three people that I know contracted it. If you go to the emergency room in the Summer with a headache (akin to a migraine) and that is something not typical for you, I can guarantee you they will do a spinal tap before you get out the door to rule out West Nile!

It is an admittedly sad and scary thing to think we might be wiped off the face of the earth by a vicious virus. I hope (like most people probably would!) that it takes us all and does not leave my children behind, alive and in further danger as they struggle to survive the aftermath. It may be selfish, but I hope we would all “go together.” Do I believe it is going to happen and/or that we are at risk? Yes, I do now. If I have learned anything during my years on this planet it is this: Anything is possible – Everything is possible. *A deadly space virus is no exception.*

My recommendation to the community at large is simply this: Do not run out and buy a bunch of face masks, but do pay attention to the news media. Get your flu shot when they offer them. Do what you can to maintain healthy hygiene habits. Get plenty of rest and eat lots of fruits and vegetables. If the rumor mill churns out a report of a contagious disease – do not panic and probably the best advice would be: Stay home. It is probably too late to say, “stay inside” – but for sure, stay home. Be considerate – protect yourself and your family/community. An odd recommendation would be: Do not use TOO much of those liquid sanitizers. In order to build immunity, a minimal exposure to some level of germs is important.

My pediatrician told me years ago when I was questioning the necessity of the “chicken pox shot” versus getting the disease and then having natural immunity – she told me this: The chicken pox virus is currently mutating. It is becoming a flesh-eating strain of bacteria. It is gaining strength because FEWER people are susceptible to the disease. The stronger it gets, the more devastating or deadly it becomes. She said that now, more than ever, the shot is important in order to offer the best protection to our children. The virus will continue to mutate and it will not be long before it, too, becomes a serious threat to our community.

I suppose that in the end, what I am **most** aware of is this: There is a *true* balance in life. There really is a yin and a yang, a right and a wrong, a good and a bad, a blessing and a curse, etc. What goes up must come down. “He giveth life, he taketh away.” No matter how a person was raised to internalize our existence – a person cannot sit through your class and sort through the materials without becoming acutely aware of how our entire solar system *breathes* with life – it “hums” with existence. It is hard to understand – but everything moves and shifts. Nothing is stationary. It just goes and goes and goes which, honestly, for me, has further cemented my own beliefs that life is endless. My body may give out and ultimately cease to function – but my essence is ENERGY – and you have shown us that there is not one single aspect of life as we know it or relate to it that does *not* have energy. It is an absolute, endless, infinite cycle. Thus, without a doubt and to borrow a memorable line from the movie, The Titanic – “space bug” or no space bug, “I will go on....”

WORK CITED

de Pastino, Blake. *Photo in the News: Mysterious Space Object Crashes Into House.*

National Geographic. January 5, 2007. <http://news.nationalgeographic.com/news/2007/01/070105-space-rock.html>

Hawk. The Spirit of the Hawk, Internet image. 2001. <http://images.google.com/imgres?imgurl=http://www.art.net/~starhawk/virus1sm.jpg&imgrefurl=http://www.art.net/~starhawk/fractals.html&h=120&w=160&sz=7&hl=en&start=9&um=1&tbnid=P-1KwuE0D-ga9M:&tbnh=74&tbnw=98&prev=/images%3Fq%3Dspace%2Bvirus%26svnum%3D10%26um%3D1%26hl%3Den>

Mega Disasters: Alien Infection. The History Channel (Where the Past Comes Alive). DVD. 2007.

Orozco, Jose. *Meteor Crash in Peru Caused Mysterious Illness.* National Geographic News, September 21, 2007. <http://news.nationalgeographic.com/news/2007/09/070921-meteor-peru.html>

Stemp-Morlock, Graeme. *Lethal Bacteria Turn Deadlier After Space Travel.* National Geographic News, September 24, 2007. <http://news.nationalgeographic.com/news/2007/09/070924-space-bacteria.html>

WORK CITED (Continued)

World Science. *Skepticism Greets Claim of Possible Alien Microbes*. January 5, 2006.

http://www.world-science.net/exclusives/060104_specksfrm1.htm