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MAT 105

Project 1: "Global Warming and Climate Change"

By Richie Heinlein

Global warming, as some would say, is a terrible problem. Just a few degrees of sustained increase would be able to cause the polar ice caps to melt, storms like hurricanes would get worse, flooding in major cities and in low-lying areas because of the water run-off from melted ice, and could upset many delicate ecosystems.

There are two mathematical ways to look at just how much danger we are truly in. If global warming is a linear issue for example, we might see increases of about .3 - .7 degrees Celsius per decade. If global warming is an exponential problem, things will get much worse. For example, if our normal temperature is 90 degrees in the summer, if there is an exponential curve by 2% per 10 years, in 40 years, we will have an average temperature of 97.4 degrees. On the other hand, if there was just a linear curve with increases of 1.8 degrees per 10 years, the temperature on average would be about 97 degrees. There isn't much difference except the fact that the few tenths of a degree gap will keep widening and eventually be the end of life as we know it or worse. The following web sites had some differing opinions: www.psu.edu, www.yosemite.epa.gov., www.washingtontimes.com, and www.abc.net.au.

In psu.edu. the author or creator of this site appears to be a university's professor. It does not look like there is a particular group or individual given. This article suggests a few things. First, the article suggests that global warming is exponential-siting that since 1958, carbon dioxide in the air went from 315 to 355 parts per million and that a large increase like this could only be exponential. Second, he states that because of large amounts of volcanic activity, global was much greater in our ancient past. Third, the professor says if the world does not change its emission rate, we could see .3 degrees Celsius increases per decade. Fourth, the professor says that CFC's are a major cause of

our exponential global warming. The professor says that CFC's are pledged to be gone by the year 2000 because of a government crack-down and other countries following suit. The professor did not offer a solution for global warming in his article.

In yosemite.epa.gov.,("Greenhouse Effect") the website is a government one. The author is one Nicolas Garcia of the Washington State Energy Office. In this article, the author said that the greenhouse effect was a good thing. Without it, he says, we would be 30 degrees Celsius cooler than we are now. However, greenhouse gasses have been rapidly increasing since the late 1800's and the early 1900's. This author uses something called Global Circulation Models to anylize the effect of greenhouse gasses. Carbon dioxide, the author says, if increased will cause an increase in water vapor. Water vapor, the author says, is a very potent greenhouse gas. This however, is debated greatly by scientists. This author states that CFC's were once thought to have a significant impact on global warming, but now are thought to have no net effect. This author states his reasoning by saying that the ozone depletion offsets the radiative forcing effect of CFC's. He says that "The GCM's predictions that include the radiative forcing of CFC's systematically overstate the warning." The GMC's state that a 2 degrees Celsius warm-up will occur if the carbon dioxide in the air is doubled for the state of Washington. These predictions are ruled as speculative. He seems neutral in his opinions on the linear or exponential issue.

In washingtontimes.com, the author of this article is Martin Hutchinson. This article is from United Press Information. Martin is a journalist. He suggests that global warming is neither linear nor exponential, but logarithmic. However, he states that the economic cost of global warming will be close to exponential because of this trend. He

thinks that carbon consumption is to blame. A few people from the Cato panel agreed that a doubling in carbon consumption per year would mean a 2.5 degrees Celsius warm-up. One, however, disagreed and said that it could be much worse. He thinks that the temperature might increase by about 9.3 degrees Celsius. This the author said might mean the death of us all if this scenario came to pass. The author, to stop even a chance of that scenario happening, proposes a carbon emissions tax, depending on how much is emitted. He thinks that this tax will give every country an incentive to lower emissions.

ABC.net.au. is the Austrailian Broadcasting Company. It is a television station. This station ran a program in 2001 about global warming. Tony Jones was interviewing two people and they were talking about the "Doomsday Debate." Dr. Patrick Michaels thinks that global warming is on a linear curve. He says if it were exponential, we would be out of air, fuel, be in an ice age, and be starving. He says that we have had a constant rate of increase in global warming for 3.5 decades. He says that nature has worked out a constant increase of 1.5 degrees Celsius for the next century. Alun Anderson, the other interviewee, doesn't think that there is a "doomsday debate." However, he does state that if we as humans don't do something to fix this problem, we could be seeing major climate changes stemming from an increase of 6 degrees Celsius in the next century. Alun Anderson seemed to be just wanting to sell his magazine through the entire interview.

In my own personal opinion, greed might be a major problem along with a lack of respect for the environment. A place that is overfished for short term profit won't support much life for awhile. Likewise, a rainforest can be overlogged. This may be

profitable for a short time, but without the trees, there won't be anything to take out excess carbon dioxide in the air. Because of this, global warming may get out of hand.

For this country however, going to an electric, alcohol, or hybrid fueled car might be best. I heard about a hybrid car that uses scraps of food for fuel. This might be an answer. I think that the U.S. should experiment more and then work to make any solution affordable for all humans. This way we can slow global warming to a manageable level so that we can be here on the planet that God gave us to inhabit for a long time. I am not sure what curve we are on, but I hope that we can do something about it together.

The study of mathematics provides projections and models for further research on the subject of global warming and climate change. Using these projections and models, we can react to problems before they show up and it's too late. Mathematics also provides formulas. Such formulas that contain percents, exponents, and logarithims feed these projections and models.

Mathematics influenced me in the fact that I don't like the sound of an exponential curve in this case. We need to react to a potential disaster soon. However, we are not so short on time thatwe can't play our cards smartly. This means to do things the smart way. As Captain Planet would say "The power is yours!" In this case, the power is ours and everyone is included.