Session 05

“Climate Change – Threat or Menace”

We Don’t Know What We Don’t Know

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Presentation

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What’s in a name?

Climate Change?

Global Warming?

Anthropogenic Global Warming?

To many they all mean the same thing, the planet is getting warmer because of we humans and things are going to get very bad.
Introduction/Disclaimer

I have never doubted that climate goes through changes, or that human activity won’t have some effect. From recorded history we know that climate makes it’s own changes, such as the little Ice age from 1300 to 1800. There have been warm periods as well.

We know that we are in an *interglacial* meaning a time between ice ages, usually 12,000 years.

The next item on the agenda, just looking at the climate record back 400 thousand years is likely the next Ice Age.

My intention is to inform the seminar of some facts about the climate on Planet Earth that they may not be familiar with. What you do with that information is up to you.

I am entitled to my opinion and you are entitled to your own. If you disagree, we are still friends, let’s talk about it. We may chose to disagree.
Notable climate events in Earth history

http://en.wikipedia.org/wiki/Paleoclimatology

See also: List of periods and events in climate history, Geologic time scale and History of Earth

Knowledge of precise climatic events decreases as the record goes further back in time. Some notable climate events:

Faint young Sun paradox (start)

Huronian glaciation (~2400 Mya Earth completely covered in ice probably due to Great Oxygenation Event)

Later Neoproterozoic Snowball Earth (~600 Mya, precursor to the Cambrian Explosion)

Andean-Saharan glaciation (~450 Mya)
Notable climate events in Earth history
http://en.wikipedia.org/wiki/Paleoclimatology

**Carboniferous Rainforest Collapse** (~300 Mya)
**Permian–Triassic extinction event** (251.4 Mya)
**Oceanic Anoxic Events** (~120 Mya, 93 Mya, and others)
**Cretaceous–Paleogene extinction event** (66 Mya)
**Paleocene–Eocene Thermal Maximum** (Paleocene–Eocene, 55Mya)
**Younger Dryas/The Big Freeze** (~11 kya)
**Holocene climatic optimum** (~7-3 kya)
**Climate changes of 535-536** (535–536 AD)
**Medieval warm period** (900–1300)
**Little ice age** (1300–1800)
**Year Without a Summer** (1816)
Glen Fergus - Own work

Note the change in time scales. The graph covers the past 500 million years.
I have created a “close up” of the most recent periods. Note the four peaks that occurred before 20 thousand years ago. The time from the latest peak til today is about 110-120 thousand years ago. Note the quick rise in temperature at the end of the interglacial and the “quick drop” in temperature that inaugurates the next ice age.
A little closer look

~110,000 years

~90,000 years

~110,000 years
But I am personally skeptical that, although humankind has certainly over indulged in what the planet has to offer, **we really don’t know what we don’t know**. For some reason it has become fashionable to believe that our debauched lifestyle and the level of CO2 alone will cause our planet to be uninhabitable.

To think we can actually change the direction of a planetary climate cycle that has repeated itself 4 times in the last half million years is a bit of a reach. To formulate major political and economic policies on conjecture could produce some disastrous results.

We have much more important matters to trend to. e.g.: Environment, Economics, Foreign Relations
The intermediate portion of the record is dominated by large fluctuations in the mass of the Antarctic ice sheet, which first nucleates approximately 34 million years ago, then partially dissipates around 25 million years ago, before re-expanding towards its present state 13 million years ago. These fluctuations make it impossible to constrain temperature changes without additional controls.

Significant growth of ice sheets did not begin in Greenland and North America until approximately 3 million years ago, following the formation of the Isthmus of Panama by continental drift. This ushered in an era of rapidly cycling glacials and interglacials (see figure at upper right). Also appearing on this graph are the Eocene Climatic Optimum, an extended period of very warm temperatures, and the Paleocene-Eocene Thermal Maximum (labeled PETM). The PETM is very short lived high temperature excursion possibly associated with the destabilization of methane clathrates and the rapid buildup of greenhouse gases in the atmosphere. Due to the coarse sampling and averaging involved in this record, it is likely that the full magnitude of the PETM is underestimated by a factor of 2-4 times its apparent height.
The Isthmus of Panama

A significant body of water (referred to as the Central American Seaway) once separated the continents of North and South America, allowing the waters of the Pacific and Atlantic Oceans to mix freely. Beneath the surface, two plates of the Earth's crust were slowly colliding, forcing the Pacific Plate to slide under the Caribbean Plate. The pressure and heat caused by this collision led to the formation of underwater volcanoes, some of which grew large enough to form islands as early as 15 million years ago. …. By about 4.5 million years ago, an isthmus had formed between North and South America. Scientists believe the formation of the Isthmus of Panama is one of the most important geologic events in the last 60 million years. … the Isthmus of Panama had an enormous impact on the earth's climate and environment. By shutting down the flow of water between the two oceans, the land bridge rerouted ocean currents in both the Atlantic and Pacific Oceans. Atlantic currents were forced northward and eventually settled into a new current pattern that we now call the Gulf Stream. …
With warm Caribbean waters flowing toward the northeast Atlantic, the climate of northwestern Europe and eastern North America grew warmer. … In short, the Isthmus of Panama directly and indirectly influenced ocean and atmospheric circulation patterns, which regulated patterns of rainfall, which in turn sculpted landscapes.[1]

Evidence also suggests that the creation of this land mass and the subsequent warm, wet weather over northern Europe resulted in the formation of a large Arctic ice cap and contributed to the current ice age. That warm currents can lead to glacier formation may seem counterintuitive, but heated air flowing over the warm Gulf Stream can hold more moisture. The result is increased precipitation that contributes to snow pack.
5.3 - 2.6 Mya Pliocene climate climate became cooler and drier, and seasonal, similar to modern climates.

Thermohaline Circulation

Gulf of Mexico Currents

**Penny Haire**  Published on Apr 14, 2012

Animation of observed currents in the Gulf of Mexico over 3 months in 2011

[https://www.youtube.com/watch?v=dypIOyR8IY8](https://www.youtube.com/watch?v=dypIOyR8IY8)
Global Currents from Tidetech
Penny Haire

https://www.youtube.com/watch?v=W8NklDuxpqQ

http://www.tidetech.org/

North East USA and Canada
What if Global Warming leads to the next Ice Age (cooling)?
On the other hand …
Maybe Global Cooling leads to just another “Minimum”

Peer-Reviewed Papers Predicting Global Warming and Cooling from 1965 to 1979

Warming

Cooling

http://en.wikipedia.org/wiki/Global_cooling

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1420798/
Arctic Sea Ice Concentration – Same Date Compared With 2007

Cryosphere Today – Arctic Climate Research at the University of Illinois – Click the pic to view at source (thanks to Ric Werme)
http://arctic-roos.org/observations/satellite-data/sea-ice/observation_images/ssmi1_ice_ext.png
From: Steve Gorman [mailto:solarhome@verizon.net]
Sent: Thursday, March 19, 2015 9:17 AM
You can add this figure to your discussion Saturday.
Ice Ages

Variations in temperature, CO$_2$, and dust from the Vostok ice core over the last 400,000 years

21 March 2015

"Climate Change – Threat or Menace"
An interglacial period (or alternatively interglacial) is a geological interval of warmer global average temperature lasting thousands of years that separates consecutive glacial periods within an ice age. The current Holocene interglacial has persisted since the end of the Pleistocene, about 11,700 years ago.

https://en.wikipedia.org/wiki/Interglacial
Reality wins, it seems. Dr. Roy Spencer writes:
As seen in the following graphic, over the period of the satellite record (1979-2012), both the surface and satellite observations produce linear temperature trends which are below 87 of the 90 climate models used in the comparison.
Holocene Temperature Variations

End of Last Glacial Period

Temperature Anomaly (°C)

Thousand of Years BP

Climatic Optimum?

Recent Proxies

2004
Note these temperature are in the Greenlanland Ice Cap
Northern hemisphere glaciation during the last ice ages. The setup of 3 to 4 kilometer thick ice sheets caused a sea level lowering of about 120 m. 

We know from the fossil record that sea levels have been much higher than present over the eons, but at the start of the last five glacial periods the data suggests that sea level had actually dropped about 120 meters due to the water that was held in the Northern Glacier. 10,000 years ago.
Phanerozoic Sea Level Fluctuations

http://en.wikipedia.org/wiki/Sea_level#Sea_level_change

Comparison of two sea level reconstructions during the last 500 Ma. The scale of change during the last glacial/interglacial transition is indicated with a black bar. Note that over most of geologic history, long-term average sea level has been significantly higher than today.
US Sea Level Trends

https://upload.wikimedia.org/wikipedia/commons/7/7f/U._S._Sea_Level_Trends_1900-2003.gif
The Maunder Minimum, also known as the "prolonged sunspot minimum", is the name used for the period starting in about 1645 and continuing to about 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.

The term was introduced after John A. Eddy published a landmark 1976 paper in Science. Astronomers before Eddy had also named the period after the solar astronomers Annie Maunder (1868-1947) and E. Walter Maunder (1851–1928) who studied how sunspot latitudes changed with time.

Spörer noted that during one 30-year period within the Maunder Minimum observations showed fewer than 50 sunspots, as opposed to a more typical 40,000–50,000 spots in modern times.

Like the Dalton Minimum and Spörer Minimum, the Maunder Minimum coincided with a period of lower-than-average European temperature.
Sunspot Progression

ISES Solar Cycle Sunspot Number Progression
Observed data through Feb 2015

http://www.swpc.noaa.gov/communities/space-weather-enthusiasts
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Why
Given that the people who run the governments of this world are repeatedly proving themselves incompetent, corrupt and destructive to their own and other peoples’ lives, property; …

Is there any particular reason that we should give particular credence to the AGW theory that many people have accepted because we are told 97% of “scientists” say we should? (Science is not a democratic process)

Is it time for the people to arrive at a common understanding of universally protectable human rights, that protect the people from each other’s evil or selfish imbibitions and adventures and from the stupidity of incompetent authority and governments.
The AGW theory is based on data that is drawn from a ridiculously narrow span of time and it demonstrates a wanton disregard for the ‘big picture’ of long-term climate change. The data from paleoclimatology, including ice cores, sea sediments, geology, paleobotany and zoology, indicate that we are on the verge of entering another Ice Age, and the data also shows that severe and lasting climate change can occur within only a few years. While concern over the dubious threat of Anthropogenic Global Warming continues to distract the attention of people throughout the world, the very real threat of the approaching and inevitable Ice Age, which will render large parts of the Northern Hemisphere uninhabitable, is being foolishly ignored.

See the handout: When will the next Ice Age Start?
Harassment Charges Against RK Pachauri

TERI director-general says he’s been a victim of hacking

Raghav Ohri@timesgroup.com New Delhi: A 29-year-old female employee of The Energy and Resources Institute (TERI) has lodged a police complaint against director-general Rajendra Kumar Pachauri, 75, alleging harassment.

The complainant, who works as a research analyst at the New Delhi-based energy think tank, has cited unwanted physical advances besides being the recipient of SMS and WhatsApp messages, emails and a handwritten note with dates and time that began soon after she joined TERI in September 2013.

Pachauri has denied all the allegations and said he’s been a victim of hacking.

“The said email has indicated misuse of my computer resources and communication devices, without my permission or consent,” he said in a response to ET’s queries. “From your email, I have come to know the fact that my computer resources including my email ids, mobile phone and WhatsApp messages have been hacked and that unknown cyber criminals have gone ahead and have unauthorisedly accessed my computer resources and communication devices and further committed various criminal activities.”

He said he has filed complaints regarding the hacking with the commissioner of police, the controller of certifying authorities and the adjudicating officer under the Information Technology Act.

“The entire computer outputs on the basis of which the said complaint has been filed and on the basis of which your questions are raised are completely false, fabricated, forged and manipulated,” Pachauri said in his email to ET. “Your questions have no connection with truth.” He further asked that no story be published with regard to the allegations until the investigations had been completed.

Pachauri is also chair of the Intergovernmental Panel on Climate Change, which was joint winner of the Nobel Peace Prize in 2007. The complainant approached Delhi Police on February 13, four days after she moved TERI over the issue.

The Lodhi Colony police station registered the complaint (DD Number 43B) at 7:30 pm on February 13. However, the police is yet to register a first infor-
Collapse: How Societies Choose to Fail or Succeed (also titled Collapse: How Societies Choose to Fail or Survive) is a 2005 book by academic and popular science author Jared M. Diamond, which reviews the causes of historical and pre-historical instances of societal collapse—particularly those involving significant influences from environmental changes, the effects of climate change, hostile neighbors, and trade partners—and considers the responses different societies have had to such threats. While the bulk of the book is concerned with the demise of these historical civilizations, Diamond also argues that humanity collectively faces, on a much larger scale, many of the same issues, with possibly catastrophic near-future consequences to many of the world's populations.

Diamond identifies five factors that contribute to collapse: **climate change**, **hostile neighbors**, collapse of essential trading partners, **environmental problems**, and **failure to adapt** to environmental issues.

He also lists 12 environmental problems facing humankind today. The first eight have historically contributed to the collapse of past societies:

- **Deforestation** and **habitat destruction**
- **Soil** problems (**erosion**, **salinization**, and **soil fertility** losses)
- **Water management** problems
- **Overhunting**
- **Overfishing**
- Effects of **introduced species** on **native species**
- **Overpopulation**
- Increased per-capita impact of people
Further, he says four new factors may contribute to the weakening and collapse of present and future societies:

- **Anthropogenic climate change**
- Buildup of **toxins** in the environment
- **Energy shortages**
- Full human use of the Earth’s **photosynthetic** capacity

Diamond also writes about cultural factors, such as the apparent reluctance of the **Greenland Norse** to eat fish.

Diamond says **Easter Island** provides the best historical example of a societal collapse in isolation.

The root problem in all but one of Diamond's factors leading to collapse is **overpopulation** relative to the practicable (as opposed to the ideal theoretical) **carrying capacity** of the environment.

The one factor not related to overpopulation is the harmful effect of accidentally or intentionally introducing nonnative species to a region.
Diamond also states that "it would be absurd to claim that environmental damage must be a major factor in all collapses: the collapse of the Soviet Union is a modern counter-example, and the destruction of Carthage by Rome in 146 BC is an ancient one.

It's obviously true that military or economic factors alone may suffice" (p. 15).
I have never doubted that climate goes through changes, or that human activity won’t have some effect. From recorded history we know that from outlier events, or so we think, such as the little Ice age from 1300 to 1800 we know that we are in an interglacial meaning a time between ice ages, usually 12,000 years. There have been warm periods as well.
Two Excellent Videos to Watch

To gain a better appreciation of our planet, how it came about and how it works

(188) IMDb 6.9/10
THE ENTIRE HISTORY OF THE WORLD IN 2 HOURS (HD) - Discovery/Science/Universe (documentary)
history life discovery science technology tech learning education national nature geographic earth planet channel universe space outer galaxy shuttle mars moon sun solar system black hole travel time world milky way quantum physics mechanics energy biology chemistry animal animals civilization civilisation ancient human humans man people age past greek rome roman egypt archaeology architecture art museum evolution stone plant geology
Teacher’s Guide
http://www.history.com/images/media/pdf/HistoryWorld2Hours.pdf

EARTH FROM SPACE - NOVA - Discovery Space Universe (documentary)
history life discovery science technology tech learning education national nature geographic earth planet channel universe space outer galaxy shuttle mars moon sun solar system black hole travel time alien aliens world nasa seti milky way parallel dimension dimensions multiverse quantum physics mechanics energy mission probe satellite hubble telescope astronomy
Publication date : 06/07/2014
Duration : 01:54:22
Category : TV
Topics : Documentary film

http://www.dailymotion.com/video/x1yt21k_earth-from-space-nova-discovery-space-universe-documentary_tv

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“The thing about us business people is that we love our customers rich and our employees poor.”

Nick Hanauer

http://www.politico.com/magazine/story/2014/06/the-pitchforks-are-coming-for-us-plutocrats-108014.html
“…we are the leaders we've been looking for.”

Grace Lee Boggs
"Labor is prior to, and independent of, capital. Capital is only the fruit of labor, and could never have existed if labor had not first existed. Labor is the superior of capital, and deserves much the higher consideration." Lincoln's First Annual Message to Congress, December 3, 1861.
DON'T PANIC!

DON'T (be) PANIC(ked)!

See you April 25, and May 16, 2015.
The Monty Python Foot, a convenient way to end something that would seem to go on for ever accomplishing nothing.... (See deus ex machina)

When Monty Python had no ending for a skit, this foot would appear out of the sky and squash whatever was on screen with a rude noise. Allowing the show to move on.
One of life’s persistent questions:

“Why do cockroaches roll over before they die?”
Curt's Corollary to that is that societies must have a free "critical mass" in order to grow; be it: socially, economically, intellectually, technically. On a world scale this has produced food and computers for the masses and atom bombs and low cost AK-47's. Having the ability to produce something doesn't seem to go along with knowing appropriateness.
What about the power of “No”

Will ordinary people be totally divested of power? Will they lose the will or motivation to organize and resist?
Leaving the 1% totally in control. But what will sustain the 1% if there is no wealth to buy the products of and technicians to maintain the infrastructure of the 1%

Will ordinary humans de-evolve into a lesser species (a reverse Neanderthal?) beasts of burden?

Or will we live in thrall to the 1%. Or will the 1% become irrelevant.

Will presently developing countries just overtake us. Will they, hungry for a better life, choose more competent leaders and build stronger economies so that the western world just become irrelevant?
In closing …
DON'T (be) PANIC(ked)

As our times get more and more interesting, some of the subjects I bring up are sounding more and more onerous or threatening.

My purpose is not to frighten anyone, even when some of the information seems to have a prophetic quality, I cannot predict the future with any accuracy, but I can distinct possibilities, given what we all see going on and we just may see some of the things we talk about take become part of our reality in the future. And if they do, then I hope by our talking about them now you will avoid being surprised and the temptation to (be) panic(ked).

Our leaders love to manipulate us emotionally into crises and panic us into a irrational fear response. Please don’t let them.
Basic Wilderness Survival Skills
From: British Columbia Outdoor Wilderness Guide

Fear - For anyone faced with a wilderness emergency survival situation, fear is a normal reaction. Unless an emergency situation has been anticipated, fear is generally followed by panic then pain, cold, thirst, hunger, fatigue, boredom and loneliness. It is extremely important to calmly assess the situation and not allow these seven enemies to interfere with your survival.

Pain - Pain may often be ignored in a panic situation. Remember to deal with injuries immediately before they become even more serious.

Cold - Cold lowers the ability to think, numbing the body and reducing the will to survive. Never allow yourself to stop moving or to fall asleep unless adequately sheltered.

Thirst - Dehydration is a common enemy in an emergency situation and must not be ignored. It can dull your mind, causing you to overlook important survival information.

Hunger - Hunger is dangerous but seldom deadly. It may reduce your ability to think logically and increase your susceptibility to the effects of cold, pain and fear.

Fatigue - Fatigue is unavoidable in any situation so it is best to keep in mind that it can and will lower your mental ability. Remember that in an emergency situation this is often the bodies way of escaping a difficult situation.

Boredom & Loneliness - These enemies are quite often unanticipated and may lower mind's ability to deal with the situation.
Mazlow’s Hierarchy of Needs

- **Physiological**
  - Breathing, food, water, sex, sleep, homeostasis, excretion

- **Safety**
  - Security of: body, employment, resources, morality, the family, health, property

- **Love/belonging**
  - Friendship, family, sexual intimacy

- **Esteem**
  - Self-esteem, confidence, achievement, respect of others, respect by others

- **Self-actualization**
  - Morality, creativity, spontaneity, problem solving, lack of prejudice, acceptance of facts
We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.