



ROAD MAP FOR LIVING IN THE ERA OF GLOBAL WARMING

SESSION VI

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- Climate News
- Responses to Questions and Clarifications, Contributions from Participants
- Ways to Make a Difference

TODAY'S AGENDA



CLIMATE NEWS

- Rising seas will swamp farmlands, pollute water supplies and displace millions of people much sooner than expected, scientists said last week, as they released new research that accurately calculates the vulnerability of coastal areas, especially in developing countries that have not had access to expensive coastal mapping technologies.

- Photo from Chittagong, Bangladesh



CLIMATE CHANGE IS SPREADING MALARIA IN AFRICA

APOORVA MANDAVILLI, NYT, FEB. 14, 2023

Mosquitoes that carry malaria in sub-Saharan Africa are moving to higher elevation at a rate of 21 ft. per year, and away from the equator at a rate of 3 miles a year. A similar movement is noted for deer ticks (Lyme disease) in the U.S.



LAUNCHING DUST FROM THE MOON COULD HELP COOL THE EARTH

The Smithsonian, Will Sullivan, Feb. 13, 2023

It would take 10 billion kilograms of dust to block 1.8 % of the Sun's rays



WHY IS 2030 IMPORTANT?

“It’s Now or Never”

“Limiting warming to around 1.5°C (2.7°F) requires global greenhouse gas (GHG) emissions to peak before 2025 at the latest, and be reduced by 43% by 2030”

--Intergovernmental Panel on Climate Change

April 4, 2022

BY 2030 WE WILL PASS THE POINT AT WHICH WE CAN STEP CLIMATE CHANGE BELOW 2 DEGREES C

- Climate scientists say that we can only emit another 800 gigatonnes of carbon — or 20 years of business-as-usual pollution — if we are to keep global warming below 2 degrees Celsius.
- Anything more could trigger domino effects set off by rising temperatures that reinforce further warming as escalating feedback loops push the Earth into a “hothouse state.”

--Potsdam Institute for Climate Impact Research (PIK) Feb, 2023.

7 REASONS SO MANY PEOPLE IGNORE, DISBELIEVE, OR ACTUALLY DESPISE SCIENCE? (A WORKING LIST FROM WILLIAM WOODRUFF)

1. **Scientists often tell the public things that they don't want to hear, that conflict with deeply-held beliefs or with intuition.** E.g., Copernicus, Galileo, Darwin, Oppenheimer (see "American Prometheus" by Kai Bird and Martin Sherwin), James Hansen, Michael Mann, Anthony Fauci.
2. **Many (but by no means all) scientists aren't good at explaining their work in terms a lay audience can understand.** Famous counter-examples include Richard Feynman and Carl Sagan.
3. **Popular media usually do a poor job of explaining science, and are especially poor at analyzing scientific controversies and identifying nonsense, or even outright fraud.** It literally took decades before popular media learned to distinguish between the consensus (and the controversies) among actual climate scientists and the fringe views, contrarian opinions, and outright charlatany of highly visible deniers

IGNORING, DISBELIEVING OR DESPISING SCIENCE

(THE WOODFUFF LIST, CONTINUED)

- 4. Unfortunately there are some scientists, including some prominent ones, who deliberately (even fraudulently) mislead the public.** E.g. the ozone hole, nuclear winter, the link between smoking and disease, and of course global warming) are discussed in the recent book *Merchants of Doubt* by Naomi Oreskes and Erik Conway - and they name names.
- 5. A lot of science takes real effort to understand,** even at a Cliff-Notes level. Superficially, much of it may just seem ornate and irrelevant.
- 6. A lot of events, trends, and phenomena that scientists can observe, describe, and predict take place on size or time scales that no naked-eye observer can see.** E.g., the Big Bang, cosmology, nuclear phenomena, virology and epidemiology, plate tectonics, and climate changes.

IGNORING, DISBELIEVING OR DENYING SCIENCE

(THE WOODRUFF LIST, CONTINUED)

7. There is a claim (generally used to attack or discredit science) that if there is any part of a phenomenon that isn't completely understood, that means that none of the phenomenon is understood at all.

In fact, very few if any phenomena in nature are completely understood. Still, we have a useful understanding of much of nature - enough to make reliable predictions.

VIRTUES IN CONTEXT

Virtues Needed for the Anthropocene

- Love as Biophilia
- Wonder & Awe
- Reverence

Virtues that need to be revived

- Empathy
- Compassion
- Humility

Importance of a Virtue is Contextual

Social role--parents/grandparents; uncles and aunts.

Occupation-- teachers, firemen, accountants, military leaders and soldiers...

Stage of life--not the same for youth and the elderly

By life situation--not the same for life in the Anthropocene, as life following WWII...

MORE ON PEAK EXPERIENCES

Maslow thinks it's a common, if not universal, human experience
Requires an openness about what can count as an important or real experience; many peaks may be dismissed, or not seen as something of significance.



MASLOW'S HIERARCHY OF NEEDS



MORE ON PEAK EXPERIENCES

Human experiences are vast and multifaceted, and can be categorized in a wide range of ways: e.g., healthy/unhealthy; normal/deviant; productive/harmful; good/bad, etc. These divisions need to be interrogated, for example, looking at what work they do, who they effect, who profits from them, who they disadvantage, etc.

- Type A experiences: rational, describable, verifiable, analyzable
- Type B experiences: intuitive, emotional, sublime, hard to describe or verify

Peak experiences fall into the Type B category, bordering on the ineffable

We have lots of Type B experiences routinely...e.g., love, joy, suffering, etc.

DESCRIPTIONS AND SIMILAR EXPERIENCES

- Maslow suggested that one of the best ways to think of peak experiences are to think of the most wonderful experiences of your life—those moments of ecstasy and complete and utter happiness. Being in love is one example of a peak experience.
- Such moments may also occur when you are in a creative moment or when reading a book or listening to music. You might feel a sense of "being hit" by a particular creative work in a way that strikes an emotional chord inside of you.
- Peak experiences bear similarities to the concept known as flow described by psychologist Mihaly Csikszentmihalyi. Flow is a state of mind during which people become so involved in an activity that the world seems to fade away and nothing else seems to matter. When in a state of flow, time seems to fly by, the focus becomes sharp and people experience a loss of self-consciousness.

GETTING TO UNDERSTANDABLE NUMBERS

THANKS TO WILLIAM WOODRUFF

- U. S. consumption: 9900 Watts per capita, or 9.9 kilowatts per capita. For example, the numbers say that, if you turn off a 100-Watt lightbulb, you reduce your share of the TOTAL US power consumption by 1%. We can make similar calculations of the effect of replacing incandescent lightbulbs with LED's, or turning down the thermostat, etc.
- Consider the average power use in the United States PER HOUSEHOLD. Household energy use in the US is about 21% of the total, giving an average power use per household of about 2580 Watts. This makes turning off that 100-Watt lightbulb, or replacing it with a LED bulb, or turning down the thermostat, seem even more important.
- Of the 2580 Watts of household energy consumption, about 52% goes to heating and air conditioning. The three other major household energy users are water heating, lighting, and refrigeration, accounting for 27% of the total.

The point is, individual action can make a difference - if enough individuals act.

REDUCING THE SIZE OF THE CARBON FOOTPRINT

To keep global temperatures at 1.5 C or lower, the average carbon footprint for an individual should be 1.8 metric tons per year

- U. S. average is 16-18 tons
- China's average is 8.2 tons
- LRC = 7.6; could get to 5.7 with more consistent effort

What can we do?

1. EAT PLANT-BASED FOOD

- Producing beef is 100 times as land intensive as cultivating potatoes
- Livestock use 80% of all arable land, but produce only 20% of needed calories
- Americans average 3 burgers a week
- Livestock are a substantial producer of methane gas, which is 80 times more toxic to the environment than carbon dioxide
- Cattle are the No. 1 reason for clearing the Amazon rain forests

2. REDUCE OR ELIMINATE AIR TRAVEL

- In the year 2019, flights produced over 915 million metric tons of CO₂ out of the 43 billion metric tons of CO₂ collectively produced by humans. This accounted for about 2-4% of all human-induced carbon emissions on the planet.
- No-Jet Set; sign a commitment at *Flight Free USA*, flightfree.org

3. BUY LOCALLY, TAKE REUSABLE BAGS, WASTE LESS FOOD

- Reduces the carbon footprint for transportation
- Reduces plastic that goes to landfills
- 1/3 of all food produced world-wide is lost or tossed
- Compost if possible

4. GET A HYBRID OR ELECTRIC CAR

- All electric vehicles will pay for the high carbon footprint of battery production in roughly 3- 4 years
- Hybrids may be better in 2023 because of big carbon footprint of battery production and generation of electricity by coal

5. BUY FEWER NEW THINGS, ESPECIALLY CLOTHES

- Buy at consignment shops and thrift stores
- Americans discard 80 lbs. of clothes per person annually
- *“A quarter of the energy we use is just in our crap.”*

Saul Griffith, physicist

6. BUY CARBON OFF-SETS?

- \$43 in carbon off-sets will compensate for a New York -- Los Angeles round trip
- \$29 month will off-set the carbon use of a couple; the equivalent of planting 310 trees
- \$39 month for a family of 4, the equivalent of planting 420 trees
- Some skepticism about buying off-sets is warranted

7. REPLACE GAS HEATING WITH ELECTRIC HEAT PUMPS

- Except in the coldest climates, heat pumps are more energy efficient, in addition being powered by a cleaner energy source as electrical grids switch to renewable sources.



8. SUPPORT A FEDERAL CARBON TAX

- So far, mostly incentives are in place (carrots but no sticks). Politically infeasible?
- The one stick on the IRA---a fee for emitting methane, applies only to large gas and oil facilities with significant emissions.
- Carbon credits for keeping it in the ground; a carbon tax for burning it.
- More than 40 governments worldwide have now adopted some sort of price on carbon, either through direct taxes on fossil fuels or through cap-and-trade programs. In Britain, coal use plummeted after the introduction of a carbon tax in 2013. In the Northeastern United States, nine states have set a cap on emissions from the power sector and require companies to buy tradable pollution permits.

9. POLITICALLY: SUPPORT CANDIDATES WHO WILL PROMOTE DEVELOPMENT OF CLEAN ENERGY

- Clean power for the electrical grid is one of the biggest ways to reduce GHGs (solar, wind, nuclear power)
- Stop development in flood zones, phase in stoppage of repair of coastal houses
- Support infrastructure needed to reduce carbon burning
- Support private initiatives to reach environmental goals
- Create clear and feasible goals and work to get the public behind them

10. POLITICALLY: SUPPORT CANDIDATES WHO WILL REDUCE OIL AND GAS SUBSIDIES

- Conservative estimates put U.S. direct subsidies to the fossil fuel industry at roughly \$20 billion per year; with 20% currently allocated to coal and 80% to natural gas and crude oil. European Union subsidies are estimated to total 55 billion euros annually.
- The environmental, climate, and public health costs of the oil and gas carbon footprint and are estimated to have totaled \$5.3 trillion globally in 2015 alone.
- Be skeptical of big oil's ads that talk of oil and gas as "the transition energy", or providing "energy security"

THE ANTHROPOCENE AS A POLITICAL CRISIS

→ JEDEDIAH PURDY, *AFTER NATURE: THE POLITICS OF THE ANTHROPOCENE*

The Neoliberal Anthropocene

- Free contracts within an open market—an “ever-intensified management” of global resources by the powerful, “by market means, beginning from current vast inequities” This was New Orleans after Katrina

The Democratic Anthropocene

- Counting all voices in how we respond, not just the rich and powerful; seeking to reduce inequalities and protect the most vulnerable, rather than letting the existing patterns of death and disease play out. . .

GLOBAL POLICY FOR ENDING GAS/OIL DEPENDENCY EQUITABLY

FROM KEVIN ANDERSON, *THE GUARDIAN*, MARCH 21, 2022

Richest “high capacity” countries

- stop oil/gas production by 2034.

Less dependent on gas/oil for economic & political stability;
\$50K GDP non-oil/gas per capita

- US, UK, Australia

Poorest, “low capacity” countries

- stop oil/gas production by 2050.

More dependent on oil/gas for economic & political stability;
\$3,600 non-oil/gas per capita

- Gabon, South Sudan

MUSIC FROM BRANT MILLER

"I Wanna Be Cool," co-written with another writer in Nashville, Will Kimbrough.

The song resulted from a collaboration with The ClimateMusic Project and Music Declares Emergency (<https://www.musicdeclares.net/us/>) to pair songwriters and climate scientists.

FURTHER STUDY

- The Great Courses www.wondrium.com
“Solving for Zero: The Search for Climate Innovation”
- Roman Krznaric, *The Good Ancestor*
- Bill McKibben articles on cultural and political change, a watchdog on big oil and gas
- Kim Stanley Robinson, *The Ministry for the Future* science fiction
- David Wallace-Wells, “Climate and Environment” editorial writer for *NYT*
- Joanna Macy, climate activist, Podcast, “Climate Crisis as a Spiritual Path”
- *The Guardian* –excellent climate coverage “Down to Earth”



THANK YOU FOR
BEING A TERRIFIC
GROUP OF
PARTICIPANTS IN THIS
MAIDEN VOYAGE!