Racing To The Finish

• No class next Tuesday
  – Weather’s too chancy
  – It’s a long trip for one class
  – I’m out of gas

• Today we shall consider
  – Voting and the republic
  – Energy
  – Trash

• Discussion: What is, in fact, reality versus the unreal nature of our current life realities on earth?
LIES

- AKA obloquy, prevarication, deceit, slander, calumny, libel, mendacity, fib, etc.

Above all, don’t lie to yourself. The man who lies to himself and listens to his own lie comes to a point that he cannot distinguish the truth within him, or around him, and so loses all respect for himself and for others. And having no respect he ceases to love

Dostoevsky

A good lie travels from Baghdad to Damascus while the truth is looking for its sandals

Old Arab saying
Quoted by Hakan Nesser
in Münster’s Case
Lies and Voting

• Humans probably need fantasy to be human; we create and preserve our fantasies by promoting portions of truth in order to deceive
  – Voting for a fantasy allows us to think we are doing the right thing
• If slave owners hold an election to allow slaves to choose their overseers
  – This neither ends slavery
  – Nor establishes representative democracy
• In the US we vote for people who represent, and are loyal to, an oligarchy as they’re telling us they are on our side; aka lying
  – Deus lo volt
  – If something isn't a lie that does not mean that it isn't deceptive
U.S. Election History

• Originally, those who lacked property were barred from voting in the US
  – The thinking went that non-property owners couldn’t be counted on to keep the common good in mind, and might sell their votes to the landowners on whom they depended

• Non-whites, all slaves & all women were excluded from voting

• There was no direct democracy nationally
  – Still isn’t
Election Realities

- Many demographers predict that 70% of the people will live in 15 states.
- By our constitution this means:
  - 30% of the population will have 70 votes in the Senate.
  - 70% will have but 30 votes.
- The conflict over parochial interests versus the common good will be tough to end in such a situation.
Are Fair Elections Good?

• Fair elections in the Middle East have produced
  – Hezbollah in Palestine
  – Muslim Brotherhood in Egypt, a coup, and now a dictator
  – A repressive Shia majority in Iraq, and now ISIS

• A fair election in India has left that nation on the brink of war with Pakistan

• Each of the winning groups had, and have, no interest in American ideals
  – They just want our life style
Election Realities

• In the West in general, and here in the US, we are experiencing frustration with the results of our elections
  – Polarized electorate makes governance tricky
• Should majority rule be the sole basis on which laws are based?
• If the majority are in favor of something that harms the minority, should that something be prevented?
• How do elections balance opinion against fact?
Asimov on Election Realities

• There is a cult of ignorance in the United States, and there always has been. The strain of anti-intellectualism has been a constant thread winding its way through our political and cultural life, nurtured by the false notion that democracy means that "my ignorance is just as good as your knowledge."

  – Isaac Asimov, 1980
Election Realities

• Elections have produced partisan results during the entire 21st century

• One political party in the US squarely refuses to accept science in its approach to voters
  – A large portion of the voting public endorses this position

• Do voters have a problem with science?
Election Realities

• Is it possible that resistance to science is grounded in an awareness that science implies a need to change for those invested in the status quo?  
  – And their/our lifestyle

• If this is true, how can we achieve an informed electorate?  
  – Remember Twain’s truism: It’s hard to get a person to understand something when he is being paid not to understand it
Are Fair Elections Possible?
2019 Energy Production/Use

• The United States became a net energy exporter in 2018 via large increases in crude oil, natural gas, and natural gas plant liquids (NGPL)
• Of the fossil fuels, natural gas and NGPLs have the highest production growth, and NGPLs account for almost one-third of our energy exports
• Natural gas prices remain comparatively low, leading to increased use
• The power sector has experienced a notable shift in fuels used to generate electricity
  – Increased natural gas-fired electricity generation leads to continued retirements of less economic coal and nuclear plants
• Increasing energy efficiency across end-use sectors keeps U.S. energy consumption relatively flat
Energy Info Administration Outlook

- EIA expects the share of U.S. total utility-scale electricity generation from natural gas-fired power plants will rise from 34% in 2018 to 37% in 2019 and 2020.
- EIA forecasts that the share of U.S. electric generation from coal will average 25% in 2019 and 22% in 2020, down from 28% in 2018.
- EIA’s forecast nuclear share of U.S. generation remains at about 20% in 2019 and in 2020.
- Hydropower averages a 7% share of total U.S. generation in the forecast for 2019 and 2020, similar to 2018.
- Wind, solar, and other non-hydropower renewables provided almost 10% of U.S. total utility-scale generation in 2018.
  - EIA expects they will provide more than 10% in 2019 and 12% in 2020.
Energy Info Administration Outlook

• EIA expects U.S. electric power sector generation from renewables other than hydropower—principally wind and solar—to grow from 414 billion (kWh) in 2019 to 471 billion kWh in 2020.
• Texas accounts for 19% of the U.S. non-hydropower renewables generation in 2019 and 22% in 2020.
• California’s forecast share is 15% in 2019 and 14% in 2020.
• The Midwest and Central power regions each see shares in the 16% to 17% range of the U.S. generation total from non-hydropower renewables in 2019 and 2020.
Why Be Concerned

• There is an enormous difference between the net energy of the "highly-concentrated" fossil fuels that power modern industrial society, and the "dilute" alternative energy we are choosing to depend upon as fossil fuel resources are retired.

• No "renewable" energy system can match the energy levels now being generated by fossil fuels.
  – It’s all about energy density
  – Batteries are not energy dense; petroleum and natural gas are.

• Our energy demand continues to grow while we are phasing out the energy dense sources of fuel.
Energy Density Facts

- The actual power source in a lithium battery is the lithium itself
  - The Lithium fuel is only 2% of the battery weight
- Oil has over 50 times the amount of energy per unit weight than the very best Lithium Ion batteries
  - Ironically, Lithium itself has around the same oxidation energy density as petrol does
  - It’s everything else needed in the battery that’s the problem
- There are fuel cell candidates that hold promise (P2G cells), but they are not on the immediate horizon
P2G Primer

• Power-to-gas (P2G) is a technology that converts electrical power to a gas fuel
  – The concept is sometimes called windgas
• There are three methods in use; all use electricity to split water by electrolysis
  – One method combines hydrogen with carbon monoxide to create methane
  – Methane may then be fed into the natural gas grid or further converted to LPG
  – LPG in turn can be converted to electricity via a fuel cell, which generates electricity and can run EVs
Energy Density Facts

• Powering an electric vehicle by fuel cell is about four times as efficient as a combustion engine vehicle
  – Even though ethanol has half the energy density of gasoline, ethanol fuel cell electric vehicle will have around twice the range of a gasoline car for the same fuel tank capacity, and refuel at the same rate as gasoline vehicles

• Ethanol can be manufactured from electricity generated entirely from renewable sources, with the conversion of electricity to ethanol providing the means of energy storage needed to cope with the highly variable nature of renewable energy generation

• Do you suppose this is a future fact, or a fusion power pipe dream; doable but extremely complex and hard?
Note: Hydropower excludes pumped storage generation. Liquid biofuels include ethanol and biodiesel. Other biomass includes municipal waste from biogenic sources, landfill gas, and other non-wood waste.

Source: Short-Term Energy Outlook, October 2019
EIA Information

U.S. electricity generation by fuel, all sectors
billions of kilowatthours

Note: Labels show percentage share of total generation provided by coal and natural gas.
Source: Short-Term Energy Outlook, October 2019
Detritus of the Land of Dreams

• HAVE WE BEEN GOOD STEWARDS OF THE ENVIRONMENT???

• WE SEEM TO HAVE MADE QUITE A MESS OF SOME OF IT
The Air We Breathe

It takes real skill to choke on air, fall up stairs and trip over completely nothing. I have that skill..
The Sea We Harvest
The Sea We Harvest

• The world’s marine catch has increased more than four times in the past 40 years - from 18.5 million tons in 1950 to 82.5 million tons by 1992

• 7 of 10 of the oceans' commercially targeted marine fish stocks are fished beyond ecologically safe limits

• Fish provide roughly 40% of the protein consumed by nearly two-thirds of the world's population
The Sea We Harvest

• By 2050, there will be more plastic in the ocean that fish
• How much of this plastic will be transformed into consumable protein?
• The food chain is slowing ingesting plastic which does absolutely nothing for nutritional value of any creature along the food chain
Water

• The total amount of water on the earth is about 326 million cubic miles of water
• 75% of the earth is covered with water
• 3% of the earth’s water can be used as drinking water
  – 75 % of the world’s fresh water is frozen in the polar ice caps.
• Water accounts for 65-90% of each human cell
Water, Water Everywhere
And Not Very Many Drops to Drink

• While 3/4 of the Earth's surface is covered with water, only 1% of it is potable

• More wastewater is generated and dispersed today than at any other time in the history of our planet:
  – One in six people (1.1 billion) lack access to safe drinking water
  – More than two in six lack adequate sanitation, (2.6 billion people)
The Land We Farm
The Land We Farm

• Farmland is being lost due to suburban sprawl, erosion, exhaustion & desert creep

• Climate change could affect water supply and agriculture through changes in the seasonal timing of rainfall and snow pack melt, as well as higher incidence and severity of floods and droughts
We Have Always Left Our Detritus Around For Others to Admire

• Human coprolites yield data pertinent to the understanding of seasonality, environmental conditions, food preparation techniques, actual diet preferences and the general health of the individual(s)

• This is achieved through the identification and analysis of coprolite contents which are often composed of fossil pollen, seeds and other plant remains, phytoliths feathers, bones, hair shell, insect chitin, parasites and non-organic compounds such as sand and dirt
Humans and Trash

• We have left our “waste” behind ever since we dropped out of the trees
• We have never really bothered with our waste
  – And this includes industrial waste which can also contaminate the land around the factories
• Even now, many people are still living with waste
  – Night earth removers in China
  – Untouchables in India
  – Hoarders in the US
• It is dangerous and deadly
• It is also a clear sign of poverty
Humans And Trash

- We seem not to have placed a $$ value on rubbish, trash or organic waste.
- When pressed, all business along the delivery chain claim that the end-user is responsible for the waste.
  - This is a logical non-starter as waste is clearly a step in the economic progression.
  - The value of land and land use is greatly affected by waste.
- Who pays?
Humans and Trash

• America is living in a state of garbage denial

• Americans discard 389.5 millions tons of rubbish every year, aka “municipal solid waste”
  – This is roughly equivalent to the collective weight of the entire US population – eighteen times over
  – And this does not include our sewerage, aka pollution
Humans and Trash

• One out of every six trucks in the US is a garbage truck
  – Their yearly loads would fill a line of trucks stretching to the moon
  – The products and packaging that end up in those trucks contributes 44% of the greenhouse gas emissions

• New York spends in excess of $2.2 billion yearly on sanitation
  – More than $300 million is spent just to transport the trash to out-or-state landfills
  – It’s like driving 8,730 new Hondas into a landfill daily
Our Trash/Sanitation Situation Encapsulates the Unreality of Our Real Lives

• All the world’s population can fit in Texas
• However:
  – Where would everyone go to the bathroom?
  – Where would we place farming?
  – As the world’s population grows, arable land shrinks
• It would require another planet the size of earth to provide a living standard comparable to Europe and the US for all these people
  – This is the reality of our existence
  – There is no way, currently, to make this not true, to make it go away, nor safely ignore
• Is this harsh or what?
Some Good News

• Warming is largely a polar phenomenon
  – High latitude areas 4X more sensitive to climate change than the equator
  – 100,000 tons of SO$_2$ per year would effectively reverse warming in the high Arctic and reduce it in the northern hemisphere

• 200 million tons/yr of SO$_2$ are already being added to the atmosphere currently
  – 25% from volcanic activity
  – 25% from human activity
  – 50% from natural processes
Some Good News

• Problem is, the SO2 needs to be injected 7 miles up to be effective

• Voila:
Some Good News

• This technology does not address CO$_2$ issues, it only serves to prevent solar heat gain by creating a reflecting layer
  – It could be shut down quickly if something went wrong, and the SO$_2$ would disperse within a few years

• At a cost of $250 million, it would cost $50 million less than Al Gore’s foundation is paying to increase public awareness of global warming
Our Social Compact
Whither Our Social Compact?

• We hear about older folk getting so much advantage from Medicare and Social Security and how the system can’t afford to help future workers
• We really don’t hear/read much about how the younger generations are gaming the system by staying away from health insurance until they need it – which makes it a losers’ proposition from the outset
By The Same Token

• Auto insurance would never work if only those drivers who had violations and accidents bought it
  – The vast majority of drivers who do nothing wrong buy insurance because the state makes them and because it would simply not work without spreading risk
• If younger people stay away from health care because they don’t need it – good drivers should stay away from car insurance because they don’t need it either
• Neither proposition has merit, but the first is part and parcel of why Obamacare is dissed
How It Is Coming Apart

• Younger people, healthy people in their 20s and 30s, want older people who own houses and have property to vote for levies to pay for schools, infrastructure and EMS
  – But why should older people do this?
  – Using the argument against healthcare, it only makes sense to vote against levies if you don’t have kids in school

• If we don’t pay it forward, both groups are saddled with a lower standard of living
  – And lots of debt
Whither Us All?

• Are we headed for an all-against-all situation?
  – It certainly has all the earmarks of one
• This is the path the Republican right is on
  – Zealots seldom think things through
• It’s like the movie Les Miserables, no one thought about how bad it would be, it just had stars and a smarmy story
  – Just like our political political campaigns
• So long it’s been good to know you
• If auld acquaintance be forgot . . .
  – Yours would be the first
• Addios