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VOLUME 8, ISSUE 2 OCTOBER 2016 FREE, AS IN BEER

Energy Review: Vaclay Smil

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Engineering and Entrepreneurship Opportunities from "Energy Myths and Realities" by Vaclav Smil

This book is a set of sober, science-based calculations and assessments. It's technical but not inaccessible. The author is disappointed with current energy debates, proposed policies, and news headlines, because they aren't based on sound reasoning. He wrote this book to fill in the science and inform the conversation.

My takeaways, below, are a study guide you can refer to when you're reading an overly optimistic book on energy or climate change. Before you get too excited, flip to the appropriate chapter and let Smil take some of the air out of an overinflated idea.

I've also listed in each section a few opportunities and challenges which would make the technology more viable. This is a flip of Smil's cynicism: he outlines the technical problems clearly. It's up to us to solve the challenge.

Chapter 1: Electric Cars

Reality: Electric cars are only a niche piece of the market, and will be long into the next decades.

Myth: All cars will be electric cars in the near future (next 10-ish years).

Smil's main points:

Slow adoption rate. Hybrid cars have taken more than 10 years to claim less than 3% of the market. Why would we think all-electric cars, which require much more infrastructure investment, would adopt to 100% in that same amount of time? Likely technology adoption rates in most researched, published scenarios put the likely share of pure-electric cars at no more than 25% by 2050 (p25).

We don't produce enough energy to charge 100% of cars, and can't scale up to it quickly. Assuming that the overall demand of a midsized electric car is around 6MW/year, if all American cars suddenly became electric, we would immediately need new power generation equal to 25% of all of the energy used in the United States in 2008 (p26).

We can't produce that much more energy soon. It took 15 years (1993–2008) to spin up that quantity of power the last time we did (p26).

Battery performance is sub-par and degrades quickly. Lithium ion batteries lose power even when idle and their performance degrades over time and with temperature. Tesla engineers expect the car battery pack to degrade by as much as 30% in 5 years (p29).

Opportunities/Challenges:

In large cities (where electric cars for commute make the most sense), 30–60% of cars are parked curbside. Since most electric car scenarios envision overnight charging in garages, how would these curb-parked cars be charged? (p25).

If all new cars were electric, 98% of cars would still be burning fossil fuels. How do we get old cars off of the roads more quickly?

Electric cars pull a lot of load; how do we manage the charging of each electric car so that we don't create a new energy peak?

Gas-fueled internal combustion engines might be a more efficient way to get energy into a car for some time to come. American energy is largely oil-produced; the tradeoff of miles per gallon of gas directly in the car vs. through an electricity generation process and transport

continued on next page

through the grid is comparable– about 38mpg for an average electric car in 2008 (p27). With this in mind, one challenge is to improve the efficiency of the gas-powered combustion engine. Such projects are underway, e.g. DiesOtto by Mercedes-Benz (p28).

What's a better energy storage solution than Lithium-ion batteries?

Reduce the power consumption of an electric car, or increase the ramp-up speed of bringing additional (sustainable) power online.

What are the main causes behind slow hybrid adoption– do they apply to electrics, and are these things we can change?

Chapter 2: Nuclear Electricity

Reality: Nuclear electricity is one of few ways to bring on large amounts of power per plant on relatively short timescales, but it's not going to be cheap, fast, or ethically straightforward.

Myth: Nuclear energy will single-handedly solve the world's energy needs by providing huge quantities of clean energy at minimal cost in the near future.

Smil's main points:

Building a nuclear energy plant is very, very slow and expensive. Between 1972 and 1992, the cost of building a new 1 GW nuclear power plant in the United States increased more than 10x. This was due mostly to increased safety regulations. The plants are now much less likely to become meltdown sites, but the adoption rate is very slow (p36).

Nuclear fission is not in our near future. Smil particularly addresses the hope of liquid metal fast breeder nuclear reactors. The subject has been funded and researched since the 1940's with no promising commercial outcomes yet (p38–39).

Opportunities/Challenges:

A big reason why new nuclear plants have been expensive is that the laws changed while construction was already underway. Another (relatedly) is that they don't follow a standard design. There may be an opportunity to greatly reduce construction cost and time by designing and implementing a standardized nuclear plant now that regulations are more settled.

Devise a good/safe/reliable method for storing a small volume of highly radioactive waste to be sequestered for thousands of years. No country has one yet (p43).

"Nuclear generation is the only low-carbon-footprint option that is readily available on a gigawatt-level scale. That is why nuclear power should be part of any serious attempt to reduce the rate of global warming; at the same time, it would be naive to think that it could be (as some suggest) the single most effective component of this challenge during the next ten to thirty years. The best hope is for it to offer a modest contribution" (p43). Assuming nuclear power should be a part of a sustainable solution– especially as a high-reliability, high-power complement to wind/solar/etc.'s fluctuating lower-wattage contribution, what further construction is necessary? (p40).

If you're firmly anti-nuclear, figure out how to redistribute the research funds. Nuclear research received 96% of all funds appropriated by the US Congress for energy-related R&D between 1947 and 1998, a total of $145b in 1998 dollars (p43).

One challenge is to create accurate public perception surrounding the social and planetary costs of nuclear energy. Waste disposal and other issues are not all worked out, ethically – but where do these impacts stand in relation to coal and oil in terms of human and environmental degradation per watt?

Chapter 3: Soft Energy

Reality: "Soft energy" is the theoretical matching of natural renewable energy flows to local power consumption. Small and local sound appealing, but are not inherently better. While there may be a place for local energy generation, a full solution likely includes many energy sources, depending on their individual economics.

Myth: The idea posits that by decentralizing power production and localizing it by community, we can eliminate inefficiencies such as infrastructure investments, transmission line power losses, and power company office workers. The result is cheaper, renewable, locally conscious power for all.

Smil's main points:

Soft energy assumes an imminent world shift to renewable energy. This would

be nice, but it's debunked in Chapter 8 (p47).

Soft energy is only a small portion of current energy usage, nowhere near the touted adoption rate. No country, as of 2000, uses local power as a major (even non-negligible) energy source. The author of the theory proposed in 1976 that soft energy would account for 33% of United States energy by 2000. Instead, it was less than 0.5% (p47).

Forcing transition to local biogas generation failed in Maoist China. As part of the Great Leap Forward, communities were mandated to produce biogas as fuel by use of a digester that would use waste products, plants, human sewage, etc. as raw inputs. Typical output was not enough fuel to cook rice three times a day (p50).

Big projects leverage economies of scale. Producing power in large plants reduces the cost of construction, transmission, infrastructure, and all the other rolled-in costs of soft energy—to the extent that it can be cheaper per watt than small, local installations.

Opportunities/Challenges:

The biogas generators in China were not maximally efficient. Proper biogas generation requires completely anaerobic digestion, precise input mixing, and temperatures above 20C. Is there an opportunity to create a more self-managing digester? What other local power solutions become plausible if made usable by non-experts?

Small and local power generation might still be a worthwhile component of an full energy solution– how can it be approached economically and with appropriate expectations? In what situations is it more effective or efficient than traditional power plant scenarios?

Chapter 4: Peak Oil

Reality: The world has a lot of untapped oil; we're not about to run out, and resource harvesting rates are asymptotic, not bell-curved. (Not Smil's point, but we actually have the opposite problem: 2 degrees celsius is the international standard of "let's not warm the earth any more than that", but oil company reserves show 5x more than the allotted CO_2 we can afford to emit as part of their currently valued net worth– see the Do the Math campaign from Naomi Klein and Bill McKibben).

Myth: Based on the incorrect belief that resource extraction curves fit a bell curve, "peak oil' is the idea that we will run out of oil to extract and then our industry will drop precipitously, returning us to a hunter-gatherer lifestyle within a few thousand years (p62–64).

Smil's main points:

The model is incorrect. The best fit for a resource extraction model is logarithmic, so while we will hit an asymptote on oil (and thus be unable to keep up with increasing demand), we won't suddenly be out of energy. (p66).

We have a lot of oil already recoverable. The United States Geographical Survey sets a 95% probability there are 400b barrels of oil that can be extracted from currently known fields. At a current global rate of ~100m barrels consumed per day, this would last us 4000 years (p68).

There's probably a lot more oil we haven't found yet. There are enormous major sedimentary fields both associated with existing land and deep underwater that most likely have a lot of oil. They have not been truly tapped until they have the same density of drilling as Texas (p68).

Opportunities/Challenges:

We aren't going to run into a physical limit on oil in the near future, so the challenge is on human restraint. How do we make it plausible to give up our existing energy infrastructure when not forced to?

How do we align exponential growth in energy usage and logarithmic growth in oil harvest?

Chapter 5: Carbon Sequestration

Reality: Carbon sequestration is not something we can reliably accomplish in an energy-efficient manner with clear and permanent results. Many otherwise valuable carbon sequestration opportunities are decreasingly powerful due to the effects of global warming.

Myth: We can keep emitting as much carbon as we want, because we can just sequester it back out of the atmosphere.

Smil's main points:

Global warming reduces the likelihood that we can count on forests and trees as permanent carbon sinks. Se-

questration of carbon in forests fluctuates to the extent that some years forests can produce more carbon than they sequester (p80). In the near future, Tropical forests' carbon impacts will change in the near future mostly due to deforestation, but many other forests will be limited by water and soil nutrient availability, especially a lack of nitrogen. This is one of the effects of global warming. We will also have more carbon-releasing wildfires across these forests due to longer droughts from global warming (p82).

Sequestering the amount of carbon we emit in trees would require truly enormous new forests. Planting mixed forests sequesters carbon at the rate over which the trees mature—so in 10–80 years after planting (depending on the type of tree), the tree must continue to live to hold carbon, but it does not offset new emissions (p82). Offsetting just 10% of 2005 carbon would require a planting as big as the combined forests of North America and Russia, or a ~15% increase in tropical forests (p82).

There is opportunity to sequester carbon in soil, but global warming makes this type of sequestration uncertain in the long term. Soil stores about 4 times the carbon that is stored in land plants (p83). Tropospheric ozone levels are increasing and can reduce plant productivity thus slowing soil sequestration. Uncertainty caused by global warming means we can't know whether soil will net store carbon from plants or net emit it from decomposition (p83).

Biochar could improve carbon sequestration in soil, but there are logistical and environmental challenges. Soil with biochar stores 2.5x carbon as soil of the same type without it (p83). However, there is currently no supply chain set up to source waste biomass (p84).

Biochar can provide only a small piece of the solution; 900 million tons of straw (the total amount produced by affluent counties) turned into biochar (ignoring the logistical and application challenges) would sequester only 2.5% of the CO_2 emitted globally in 2005 (p84).

Pumping CO_2 into basalt might have a small effect, but it's unproven. The idea is to trap CO_2 in basalt layers beneath the Indian Ocean and/or the Juan de Fuca tectonic plate. This method, if functional, could only trap 4% of American CO_2 emissions—so, this would be less effective than raising car emissions standards (p87).

We don't have an infrastructure to capture, move, and sequester carbon. Most sequestration solutions depend on pipelines of CO_2 and other infrastructure that we don't have and which will take time to build (p87).

Sucking carbon out of the atmosphere is highly experimental. One specific project posits the deployment of artificial trees that circulate a carbon-sucking liquid (likely an aqueous solution of calcium hydroxide). Each of these trees could theoretically suck up to 90k tons per year, so it would take only 160k of these to remove half of global carbon emissions from 2005—assuming the trees have access to lots of wind (for high throughput) or high elevation (where carbon concentrations are higher). Circulation of the fluid and extraction of the carbon from it may be energy-intensive. Then, the problem of sequestering the carbon is yet unsolved (p89).

Capturing carbon at its source is a good idea, but companies are not incentivized to capture and sequester their emissions. "CCS" (carbon capture and sequestration) involves sorting CO_2 out of exhaust at its source, transporting the CO_2 (typically, in compressed form through pipelines) and injecting it into underground structures (p89).

Carbon sequestration through direct intervention by humans has unknown long-term effects. We don't know what effect there is in injecting CO_2 into underground structures. Sudden, catastrophic events might include earthquakes which rupture reservoirs and emit the CO_2 gas directly back into the environment. Slow, long-term effects could include chemical reactions between stored CO_2 and surrounding groundwater; some evidence suggests that this could result in heavy metals in drinking water reservoirs (p94).

Opportunities/Challenges:

Soil carbon is currently at half of preagricultural levels (because of intensive farming practices), so there is opportunity to store much

more carbon in soil while also improving soil productivity (p83). Biochar could be a piece of this practice, though its integration currently requires tillage of the land (which can be environmentally destructive) (p84).

Potential sources of biomass to pyrolize into biochar include crop residues and forestry waste. However, both of those include yet-unsolved logistical challenges, and might be environmentally destructive to collect (p84). Is there a better biomass source available? Can forestry and crop waste be collected effectively and nondestructively?

Oil and gas companies already use CO_2 pipelines and injections to harvest oil, so there is strong technical feasibility for transport and underground injection of CO_2. We could even use the existing infrastructure, as a profit incentive for oil & gas companies. Is there a way to use this infrastructure and build additional for carbon sequestration? (p90).

Improve the efficiency and deployment of carbon-sucking "trees" and other artificial techniques. Key areas of work with the "trees" mentioned are the energy required to keep the sorbent fluid circulating (especially in high wind), and the heat-intensive CO_2 gas extraction process from the aqueous solution of calcium hydroxide (p89).

Figure out a long-term place to put sequestered CO_2 such that it cannot rupture and leak into the environment.

Chapter 6: Biofuels

Reality: Biofuels could someday be a promising supplement to oil-based fuels, but right now massive deployment relies on processes that have not been proven commercially viable. Additionally, harvesting the biomass for biofuels can be environmentally destructive.

Myth: We can replace all of our gas and oil use with biofuels like corn-based ethanol.

Smil's main points:

Ethanol is not an efficient energy source. The energy content of ethanol is 65% that of gasoline (p98).

Corn-based ethanol requires more land than we can use. If all of America's gasoline were from corn derived ethanol, the growing of corn to cover American fuel use would require 220mil hectares, 20% more than American arable land (p101).

Ethanol-providing crops can contribute to environmental degradation. In corn crops, nitrogen fertilizer runoff is a key negative effect (p103). In other crops, such as sugar cane, expanding need for arable land can contribute to deforestation (p101).

Opportunities/Challenges:

Sugar cane is better than corn for ethanol production because it requires minimal fertilizer and has a higher power yield per hectare of planting (p104). The United States has high tariffs on Brazilian sugar cane ethanol, so it is not commonly imported into the United States (p105). Is there a way to grow sugar cane (or a higher power yield crop) in a place with more favorable trade conditions where sugar cane can be sustainably grown?

Cellulosic ethanol is a promising technology to turn waste into biofuel, but it is yet unproven as commercially viable. Though it will take decades to scale up this industry, it is worthwhile to research potential processes for creating cellulosic ethanol (p108).

Since energy density is lower in biofuel than in gas (and we have inefficient vehicles) miles per gallon would be low and fuel weight could be significant in a biofueled car (p114). Can this inefficiency be decreased?

Chapter 7: Wind Power

Reality: Wind power has several challenges, particularly in infrastructure and height of wind harvest, to overcome before it can come close to promised power production quantities. If you'd like to delve more deeply into wind power challenges, I found Ramez Naam's post on the subject more thorough than Smil's chapter.

Myth: Wind power will provide all or nearly all of the energy we need in an infinitely renewable manner in the near future.

Smil's main points:

Wind can theoretically be a major source of renewable energy, but never 100% of power needs. In 2007, global electricity production was 1,800 TWh (p125). Globally, about 1,200 TWh is dissipated within 1km of the earth's surface– and therefore harvestable (p121).

Wind power requires a

lot of land (in windy places). A reasonable assumption of wind power capacity factor (the actual power output divided by the maximum theoretical output) is no higher than 25% based on measurements in Europe, so 4.1 TWh of installed capacity would cover half of 2007 global power needs—which would cover a space equal in area to four Frances, assuming 2 W per square meter (p125).

Opportunities/Challenges:

North America is particularly well suited for wind power generation because there is a high land area of strong winds areas distributed across the land. But the continent also has prolonged calms and excessively strong winds; both conditions halt wind power generation (p128). How can wind power be stabilized or complemented to provide steady renewable power at peak times?

There are not currently many high voltage power transmission lines from America's windiest sites to its most populous cities. How can we get wind power to where it's needed efficiently?

Winds are steadier at higher altitudes, but transportation logistics of very tall wind turbines is already a challenge for the technology. What are creative ways to harvest high-up wind energy without requiring the transport of massive structures? (Companies such as Altaeros have creative approaches to this problem.)

Chapter 8: Pace of Energy Transitions

Reality: It takes many decades to transition between energy types. Humans took hundreds of years to move from wood, to coal, to oil, and we should expect a similar timescale to move away from oil and coal to any next energy staples.

Myth: We just have to solve a few key problems, and then we can expect mass adoption of renewable energy sources in our lifetimes.

Smil's main points:

Energy transitions are slow by nature. Oil took 50 years to climb from first commercial production to a 10% market share, and we continue to depend on prior dominant energy forms: coal, wood (p138).

From data up to 2008, we are not currently transitioning off of oil. In 2008, energy from new renewable energy sources was less than 2.4% in the United States. The American dependence on foreign oil has climbed steadily since at least 1973 (p135).

Quick energy transitions destabilize economies. Any new technology adoption requires a heavy up-front investment (estimated by Smil at at least $3 trillion. This is needed both in the energy sourcing and transport infrastructures, and in the "primary movers", the major users of the new energy (such as cars). Primary movers take years to become efficient (p138). Quick changes in primary energy sources leaves less time to build infrastructure and primary movers. Transition also requires people who had invested in the old system to write off of that infrastructure investment (p142).

Renewable energy doesn't work well with our existing energy grid. This is an energy transmission problem; the population centers of the United States are at the coasts, but the best spots for wind and solar are far from there. We don't have high-voltage transmission lines between them, and thus no good way to move that power (if generated) to where it is needed.

Opportunities/Challenges:

To what extent is it possible to adapt existing infrastructure to clean energy sources?

How can we anticipate the market by creating primary movers that will work renewably with the new energy system we seek but also functionally within the existing system?

I liked this book because it was straightforward, in good faith. Smil is uninterested in convincing you that climate change is real, or that we need to change our energy usage, production, et cetera. He just wants to explain, in detail, why widely touted solutions and expectations will not work.

I encourage you to read this not as discouragement, but as a starting point and an opportunity for further ideas in the space. I enjoyed Smil's work, but found him quick to write off genuine improvements in our carbon economy just because the effect they can have is small.

Challenging problems, well defined, make for a good place to start .

Out of the Ashes

Leon Lam
Contributor

Chapter 7
[A CLANSMAN CLAIMS TO HAVE KILLED ONE OF YOUR ORDER. WHAT WILL YOU DO?]

You look into his eyes and he stares back. Wariness flickers through his gaze for a moment and his hand twitches toward his belt, but you look *deeper* and see–

Revulsion. Rage. *You should not exist,* his gaze seems to say. *You belong in hell, not on earth*. And beneath that…

Sorrow. Pain. Loss.

"I'm sorry," you say instinctively, and for a moment he looks surprised. *Not the response he was expecting*, you suppose. *Anger, perhaps. Indignation or outrage, maybe. Not this.* "It seems war has taken its toll on all of us. I would hear of your battle, if you are willing."

There is a long moment of silence before he stares down at his boots. "It was not so glorious a deed," he admits grudgingly.

"But it was done nonetheless," you reply. "He had comrades. Friends, perhaps. Family. Knowing his fate will be good for them."

"Will it truly?" The Plainsman looks up at you, a ragged edge in his voice.

"No," you say. "But uncertainty is worse."

"You may be right," he says. "I will tell you–"

"It is time," Ambassador Yesui cuts in as one of the courtiers beckons to her. "Come, Zhenjin."

"–some other time, then." The man – *Zhenjin* – bows to you and turns away, and you remember–

You remember wind howling across a cloud-darkened sea of dying grass. You remember the taste of tea, warm and rich – as foreign to you as kindness. You remember a father's fondness, a warrior's pride; a dying man's resignation.

What a small world we live in, you think with a sigh. *What a small, bloody, cruel world.*

It's not long before another courtier beckons to Lord Anselm. He steps forward, red coat swishing, and you and Adrian follow close behind.

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The palace doors swing open silently, several tons of perfectly-balanced steel pivoting on massive columns. You look around as you enter; the palace's interior walls are painted to match the city at dusk – ten thousand buildings glowing by lamplight, roads and thoroughfares branching like the roots of some great tree.

A faux horizon calls to you in every direction, mist-shrouded peaks and moonlit lakes rendered with lifelike precision. As you look up, you see a night sky of black velvet studded with shining diamonds, each star a gleaming point of light in the darkness. And the floor–

The floor–

The floor is a painting of an underwater grotto filled with fantastic creatures and figures in bright finery, a riot of color captured in infinitesimal detail. You can't help but wonder what kind of genius could have produced a work of such magnitude…

Then the figures *move* beneath you, a shoal of fish flickers by in an iridescent torrent, and you realize it's *real*. A caldera filled with water, glass walls and ceiling cunningly placed for men and women to walk alongside the wonders of the sea…

The sheer cost of producing such a structure – acquiring the glass, setting it in place so snugly that a drop of water could escape, capturing the aquarium's inhabitants and keeping them fed…

Lord Anselm seems vaguely impressed, but Adrian is all but gaping at the sight. "It's beautiful," he whispers.

Lady Jin smiles at your expressions and steps forward, descending a great glass staircase mere feet from the entrance. "This way, Honored Guests," she says, and you follow.

You're surrounded by people when you step off the stairs – servants bearing platters, grave ministers in dark robes, scions of the Great Houses in fine silk seated at food-laden tables. A gilded dais sits at the far end of the hall, obscured by shimmering curtains.

The throne.

Soft strains of music mix with the hum of conversation as a herald glances down at

his scroll.

"Ambassador Anselm of Imvarr," he calls out. "Lady Jin Yuehai." Every eye in the banquet hall turns to regard the four of you – a wave of polite applause washes across the room, nobles and ambassadors and ministers giving you their best courtly smiles.

You can't help but remember your superior's words: *"He who smiles widest hides the sharpest knife…"*

Lord Anselm grins then, his manner brisk and carefree. "Time to get down to business."

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The Emperor is displeased. Influence rolls off him in waves, heating the surrounding air as you approach the dais. A mere suggestion of warmth soon turns into the relentless heat of the midday sun, but you ignore it. You have been through worse.

Lord Anselm's expression doesn't change a whit as he strides through the furnace, but you spy a bead of moisture running down his forehead. Adrian and Lady Jin are not so lucky – the noblewoman's face is flushed and drenched with sweat. Your colleague has it even worse, stumbling over his own feet and gasping for breath as he contends with smothering Influence.

First the torturer and now this, you think. *Are all kings so desperate to prove their power?*

The four of you stop at the base of the dais. Lady Jin falls to her knees, forehead to the ground, and the three of you take a knee beside her. "Long Live the Emperor," the four you say in unison, but the suffocating presence does not recede.

Instead, there's a rustle behind the curtains, and the Emperor of Reshan replies: "Welcome, ambassadors of Imvarr."

Son of Heaven, Lord of Ten Thousand Years. The voice that emerges from the curtains is smooth and clear, but there is steel in it. This is the voice of absolute authority, every word bearing an almost unthinkable weight. "We are glad to have you in our courts. We trust our hospitality has been… sufficient?"

"Very much so, your Highness," your superior replies, ignoring the scorching heat. "We have no complaints–"

Dark blood oozes from Adrian's nostrils, and he pitches forward with an agonized groan. You catch him before he hits the ground, draping a protective cloak of Power over his form as concerned muttering breaks out amongst the onlookers, and anger rears its ugly head yet again.

"Your Highness," you say quietly; Lord Anselm winces but doesn't intervene. *"Don't you think it's a little warm in here?"*

The heat doubles in intensity as the Emperor brings the full weight of his Influence down, but you stand firm. *"Offer the Reshanese all the respect they are due,"* you remember Lord Anselm saying, *"but accept no insult. We are here as equals."* You envelop your companions in an aegis of Power, turning the worst of the magic aside, but it will not hold forever–

Then the murderous heat dissipates, and the Son of Heaven laughs long and loud. "Our presence tends to overpower those of... lesser strength," he says. "We will keep your companions' frailty in mind, next we meet."

"Thank you, your Highness," you say.

"Of course," he replies. "Rise, then, and enjoy the festivities."

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The four of you get to your feet and retreat into the crowd. The dignitaries give you a wide berth, not wishing to risk the Emperor's displeasure, and you take a seat at one of the tables. Adrian collapses into a chair and lays his head on the wood, eyes closed.

"That was close," Lord Anselm says. "I know I told you not to take any insult lying down, but…"

"I think my life just flashed past my eyes," Lady Jin murmurs, snagging a glass of wine from a passing servant's tray and downing it in a single gulp. "Please never do that again."

You lower your head. "I apologize." *I was operating at peak capacity before we arrived in Reshan, you think. But now my judgement is lapsing.* "It–"

Adrian cuts you off. "He's so strong," he groans. "God. I gave it everything I had, but he crushed me without even trying."

"It will not happen

again," you say to nobody in particular.

~~

It's not long before Lady Jin leads Lord Anselm away to confer with the Minister of Finance, an especially grave looking man in dark robes. You listen in on their conversation for a few moments, but it's nothing but pleasantries and honeyed words.

"How are you feeling?" you ask Adrian after a moment.

"Like shit," he says, giving you a wobbly grin. "But it's getting better. Thanks for the help."

"Think nothing of it," you say, as a servant loads up your table with food – a rainbow of spiced meats and pickled fish and dozens of other dishes you cannot identify. "You should eat."

"Maybe," he replies, eyeing the luxurious spread. "There's so *much of it*," he says. "Where do I even start?"

"Wherever you like," you say after a moment's thought. "It's not going to disappear."

Adrian heaps his plate with a morsel from each dish before digging in, hesitantly at first and then with the haste of a starving man. You raise an eyebrow, and your colleague freezes with his chopsticks in his mouth when he finally notices. "Magic is hungry work," he says defensively, and you can't help but laugh…

Then you hear footsteps over the murmuring and music. You look up to see Ambassador Yesui approach your table cautiously, her bodyguards not far behind. "May I sit?" She asks in the language of her people.

"Please," you reply in kind. "Lord Anselm is busy at the moment, but you are welcome to wait with us." Adrian nods in agreement.

Yesui inclines her head and beckons to Zhenjin, and the two of them sit down. "You speak our tongue well," she says after a short silence.

"You are too kind, Ambassador," you reply. "How may I be of service?"

"Zhenjin is recollecting the tale he promised you," she says, "and I simply wish to talk."

"Ah," you reply. "Did you have any particular topic in mind?"

"Well," Yesui begins, "I cannot help but notice that Lord Anselm is thirty feet away from your person..."

"He is well-protected," you reply. "No harm will befall him while I am alive."

"You seem awfully confident in your abilities," she goes on. "Defying the Emperor was counterproductive at best; suicidal at worst."

"It had to be done," you say, angling your head toward the Prime Minister. The delegates of Reshan's conquered territories descend upon him in a gaggle of ostentation, bowing and scraping and proffering gifts. "Imvarr is no vassal state. We are equals."

Yesui's eyes gleam in the lamplight. "I suppose," she murmurs with wry amusement. "They remind me of dogs, baring throat and belly for scraps from their master's table."

You shrug. "An obedient hound will always have food, warmth, and shelter."

"You should know," Yesui replies, but there is neither heat nor venom in her voice. "Have you ever been free to choose your own path, Knight?"

"Have you?" you ask in return. "A wolf chooses to hunt; a dog chooses to serve. But they are both slaves to hunger, are they not?"

"True," Yesui says, and you see something that looks like respect in her eyes. "But a dog depends on the kindness of its master; a wolf depends on speed, cunning and the cooperation of its pack. They are beholden to none but their equals."

"In the lean winter, a dog can count on its owner," you counter. "But the wolf must find larger quarry or perish, and a bear, even tired from its long sleep, is no easy prey."

"I cannot dispute that," Yesui whispers, and for a moment you worry that you have gone too far. Then she smiles warmly and says: "But that is why I am here, yes? Perhaps the time has come for the wolf to find a master."

WHAT IS YOUR REPLY?

1. [Critical. "For all your talk about freedom, it seems you are more dog than wolf."]
2. [Neutral. "Perhaps. Good luck, Ambassador – you'll need it."]
3. [Supportive. "There is no shame in survival. I wish you all the best, Ambassador."]

Horoscopes by Drunk Editors

Libra (Sept. 23 – Oct. 22): You'll be surprised by what you can achieve. Stay close to your friends. It is possible to get lost on campus.

Scorpio (Oct. 23 – Nov. 21): Get out of your dorm room and try to find a place on campus that no one else knows exists. Be adventurous (or lie).

Sagittarius (Nov. 22 – Dec. 21): Let me guess your Halloween costume: drunk college student at a party?

Capricorn (Dec. 22 – Jan. 19): Every single printer is going to run out of paper on Thursday, October 13th.

Aquarius (Jan. 20 – Feb. 18): A beber y a tragar, que el mundo se va a acabar.

Pisces (Feb. 19 – March 20): There are only so many days out the year when drinking a pumpkin spice latte is acceptable/possible. Take advantage of it while you can.

Aries (March 21 – April 19): If you have 2 overdue p-sets, 6 hours of meetings, reading for that Wellesley class, and code that even the NINJAs can't figure out, why *wouldn't* you go into Boston for the weekend?

Taurus (April 20 – May 20): Oh, dear. look at the time. The little horoscope fairies have long passed out. Here, write your own:

_____
_____
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Gemini (May 21 – June 20): Do you know all the courses you need in order to graduate? (Seniors, here's looking at you).

Cancer (June 21 – July 22): Professors love frantic emails 5 hours before the deadline. Remember that for your next lab.

Leo (July 23 – Aug. 22): Fall only comes once a year. For like, a quarter of the year, but you know what I mean. Take those Instagram pictures while you can, soon you'll have more frozen water than anyone can deal with.

Virgo (Aug. 23 – Sept. 22): When homework threatens to crush your very soul, just remember that Fall TV is back, and just about everything is up-to-date on Netflix. You *will* get through this.

"Imposter Syndrome"

Jeremy Ryan
Contributor

SERV Activity Update

Kelly Brennan
Contributor

The Daily Table: Service Activity Leadership by Emily Yeh
Volunteer at the Daily Table in Dorchester! Daily Table is a nonprofit organization that makes affordable and healthy food available to people with low incomes. A group from Olin will be volunteering there every Saturday from 11am to 1pm, starting in October - check the Carpediem mailing list or visit http://tinyurl.com/DailyTable to sign-up! If you have any questions, please contact Emily Yeh.

The Food Recovery Network: Led by Mackenzie Frackleton and Issac Vandor with GROW.
Come to GROW dinners every Thursday at 6PM under the clocks to be a part of our discussion about shaping FRN this year! We need volunteers, especially those who can drive, those who would be willing to volunteer their car, or those who can use one of the Zipcars at Babson. SERV will reimburse mileage expenses as part of service funding, too! We also need underclassmen who are looking to take a leadership role soon, so please contact Mackenzie if you're interested.

***Gique: Ashley Funk**
Gique is a Boston-based nonprofit 501(c)(3) organization which exists to inspire and educate youth in STEAM. Through after-school programs and educational workshops, Gique builds a community full of the next great thinkers, leaders, & makers. Workshops through the after school program occur Wednesday evenings at the Boys and Girls Club of Dorchestor, and additional workshops take place throughout the semester.

***Charles River Center: Emma Price**
The Charles River Center strives "to empower and support people with developmental disabilities by offering high-quality, individualized opportunities that foster independence and community inclusion." They have after school, job placement, weekend, and after work programs as well as events (like 5Ks and Special Olympics) that can all benefit from additional volunteers! If you are looking for a fun and very rewarding volunteer service, I highly suggest it!

***Newton Food Pantry: Logan Sweet**
Located in the basement of Newton City Hall, the Newton Food Pantry focuses on healthy, fresh food. By working with community gardens and local farms, they provide produce in addition to non-perishables. There are volunteer time slots on Wednesdays in the morning, afternoon, and evening, and they especially need people who speak Russian.

***The Food Project: Aaron Greiner, Gaby Clarke**
The Food Project engages youth and works on food justice issues through running 70 acres of farm in the Greater Boston area and the North Shore. They work on advocacy, youth development, and much more. Their farms, which are largely run by youth and volunteers, produce food that is sold at affordable prices at places like farmers markets. They have volunteer opportunities at all of their farms throughout the week.

Big Brother Big Sister College Campus Program:
Big Brothers Big Sisters recruited a lot of Oliners at club fair, and is currently working to match each volunteer to the ideal Little. New Bigs will meet their new Littles for the first time in late October, and bi-weekly outings at Babson will begin in early November.

Blood Drive: Frances Devanbu and Ariana Olson
Olin's fall Blood Drive is October 14. Donor and Volunteer signups will be available starting late September. Lookout for the signup table in the dining hall as the date approaches! Contact Frankie (Frances.Devanbu@students.olin.edu) or Ariana (Ariana.Olson@students.olin.edu) with any questions.

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*Students are volunteering for these organizations as part of Sara Hendren's Critical Design Activist Engineer Course

Oh, Hey There, Olin

Jayce Chow
Editor in Chief

Letter From The Editor, better late than never, right?

Hello to the 80 some-odd first years and exchange students that I've never met before (and in the case of the exchange students, never will...).

How are you liking Olin, and how is the work load treating you? (Just wait until literally half the school tries to print posters on the same night, and one of the poster printers is broken).

For those of you that either don't check your emails or just don't care that much about what I write when I send out Frankly Speaking, I'm not on campus this semester. But because I'm not working or studying abroad or volunteering or doing anything remotely useful, y'all still get Frankly Speaking. Aren't you lucky?

And now I get to nag you about contributing to this newspaper that magically shows up around the first of the month. Side note: huge thanks to Mitch Cieminski and Justin Kunimune for editing and printing and folding and distributing. They do a lot to make this paper happen; as in, it wouldn't be sitting in the Dining Hall without them.

Frankly Speaking also doesn't exist without submissions. If you like writing, drawing, creating puzzles, spouting opinions, telling stories, or even rambling on in complete gibberish, SEND IT IN FOR PRINT.

This is a newspaper of, by, and for the people. Your submissions are not vetted, censored, or restricted. Some pieces need to lose the occasional word/sentence/paragraph for clarity and/or formatting, and as always, I reserve the right to request that poems be kept to a minimum.

But if you want to write an op/ed praising the analogue computer or draw a maze that leads the reader through the margins of the paper to eventually find a series of key words that spell out a secret message, IT WILL BE PRINTED.

Just submit. You have nothing to lose, and all the recognition/notoriety to gain.

Jayce

P.S. I have this random column of space, so I'm going to impart some wisdom that I've gained from working on a house with structures built by less-than-commendable people.

Do not use nails. Specifically, don't use nails on structures that may need to be replaced or when the nail will be at an angle that will make it nigh impossible to be removed from.

Don't use four different types/sizes of nails to secure a singular piece of hardware. Don't use the wrong nail for the wrong job. Don't hammer the nail until the head is flush with the metal bracket.

Just use screws. Screws go in and come out easily. Screws are your friend. Screws love you.

<3

Want to write for Frankly Speaking?

Send us your articles at
JAYCE.CHOW@STUDENTS.OLIN.EDU
Or check out the website at
HTTP://FRANKLYSPEAKINGNEWS.COM

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