General Book Notes

The Heretics: Adventures With the Enemies of Science

"Treason" (Creationism)

LURID = bright, brilliant, gaudy
TUMESCENT = pompous, pretentious language / swollen due to arousal
SHIBBOLETH = a custom or tradition specific to a group that is outmoded
PRIMEVAL = ancient, prehistoric
INVEIGLE = persuade someone to do something by means of flattery/deception
PORTENT = omen, warning, bad sign
SYNDICATE = group with a common interest, whether the mafia or bank, and the verb form of the word is to transfer assets to a syndicate

- It's not just that people can't connect academic learning with the real world or their belief system, but instead that they are fearful of diving too deep into the abstractions under which both their academic and belief knowledge lie, for they will likely discover dissonance and conflict, which they don't have to face if they blindly hide behind truisms and abstractions.
- Having grown up in a scientific family and elite schools, I have faced selection bias and must acknowledge that there are middle class suburbs around the world where these backwards beliefs are taken as axioms. To question them is to spit in the fact of the community' identity.

"*I Don't Know What's Going on With These People" (Ghost Hunters)*

IMPETUOUS = rash, reckless
EPHEMERA = things used only for a short time
CHASTENED = humbled, subdued, flattened
SUMMARILY = instantly, immediately, without any formalities

- If you're outraged at someone holding a belief, it means you haven't empathized with them enough, or understood why they think the way they do. It means you're too close-minded, not that they're necessarily correct.
- We don't fully understand the brain at all. When you look at all the UFO sightings and get those people studied by psychologists and psychiatrists, they come from myriad backgrounds and have nothing visibly wrong with them, not hallucinations, sleep paralysis, or anything else we might conjecture might be responsible. Some things really are open questions right now, we don't know if they genuinely were captured by UFOs or if there's a mental condition we don't understand right now.

"The Secret to the Long Life of the Tortoise" (Yoga)

ASCETIC = abstinent, non-indulgent
TIMBRE = tone, sound quality
BEGUILING = charming, in a deceptive way

- Belief births huge industries. Billions of people spend trillions of dollars on things that aren't actually effective or useful, but because they believe in something as part of their identity. There's huge opportunity here if you understand what people believe and why they believe it.
- Placebo only helps with perceived difficulties; pain, anxiety, depression, not with actual cancers or heart attacks.

"Two John Lennons" (Past Life Regression)

- Often, talk-based cures, like therapy, hypnosis, rely on the placebo but also make it more powerful by virtue of the fact that a figure of authority, and indeed, just another human being, is there to make the experience more formal and n our mind, more effective.

"Gross Sensations" (Vipassana Meditation)

BLITHELY = carefree, casually indifferent

- Vipassana sounds like a sick experience—meditating for 10 days straight, apparently, causes your mind to think about unusual things and behave in strange ways, leaving you with novel feelings and experiences.

- We often hold our beliefs on a pedestal ourselves, when we have several unfounded beliefs from which we hide behind abstractions.
- The Stanford prison experiment took undergrads and made them act out prison conditions. After a certain period of time, and with a convincing enough environment, they came to truly embody their characters, and good people did bad things when given enough unchecked power. It had to be called off early.

"The Invisible Actor at the Centre of the World" (Pyschology)

- The human is one of the only animals that gives birth to live young prematurely, when their brains are around 2 years away from meaningful maturity, just to be able to fit the baby's head through the birth canal.
- Dreams are so interesting. Isn't is crazy that we can experience fantastical things in perhaps the greatest, most immersive physics engine of all—our own brain?! I must try lucid dreaming and experience sleep paralysis at one point.

MOSEY = walk in a leisurely manner
PANOLPY = array, spectacle, menagerie
TRIUMVIRATE = a group of three things (three men holding power in Rome)

- There are hundreds of hidden and subtle biases and effects that color our brain's interpretation of the world, and it's in our interest to try and viscerally understand the most important ones so we don't succumb to those biases. An example is how people behave when drunk according to cultural expectations of alcohol—Latinos become friendly and peaceful, Americans become aggressive, and so on. In short, many of us who hold backwards and obviously untrue beliefs are merely victims of psychology.

Quack (homeopathy)

- Homeopathy is treating like with like. If X causes a disease, cure the disease with X, diluted 30-fold (to the point of being pure water). Many "skeptics" blindly call homeopathy fiction (which it is) without any backing, thinking themselves on a pedestal. Einstein would disapprove—he would understand the moderate take—that there are no *good* studies that support the practice, but there is some limited evidence to suggest it might work in some situations to some extent. A famous study trying to see if it works basically counted the number of cancer cells before and after, and the counting process under the microscope was subject to bias, unwittingly.

INOCULATE = inject, protect from disease/vaccinate

"Some Type of Tiny Wasp" (Fictional Disease, Morgellons Disease)

- Some people complain of intense itching under their skin accompanied with thin fibers protruding from their skin. When you investigate the condition, sometimes analysis of the fibers finds that it's clothing fibre and other times we have never seen anything like it. When people started coming forward with the disease, because it's nothing like what medical professionals saw before, they dismissed it as delusional parasitosis, a broad term that has no ready cure aside from anti-psychotic drugs. Increasingly today we realize that it may be caused by pathological factors, but the evidence is still mixed. Despite this, individual physicians often seem convinced it's one way or another—the modern medical institution can sometimes resemble that of antiquity, especially in the outlook of the doctors working in it. Alternatively, it may be a nervous condition making you feel itchy in a subtle way causing you to itch your own rashes into existence, and when you go to a dermatologist, they prescribe mental illness medication.
- This relates to humanity's poor understanding of complex systems. Psychiatrists still approach disease by pattern matching symptoms to a book they have with pattern-matched treatment, nowhere near anything analytical or closed form. Yet psychologists/psychiatrists prescribe these things with absolute conviction.
- An innate bias we should tackle is that to categorize things strictly. We want to come away from a topic with a concrete, explainable take-away, a tangible learning, not feeling more confused than when we started (which sometimes is in fact the best indicator that we're learning at all). We try to weave glimpsed facts into a clear, explanatory narrative that fits

some sexy, memorable structure (underdog, love story, etc.) loosely and subconsciously, without knowing that very often the narrative we tell ourself is a much poorer description of reality than our original set of disparate facts. What if pranayama doesn't do anything in itself, but the placebo it enacts is a powerful healing mechanism, what if Morgellons sufferers *are* crazy, but only because of rejection and incorrect prescription from myopic physicians.

"*Top Dog Wants His Name In" (Schizophrenia)*

- Psychiatrists believe schizophrenia to be a clinical condition because it visibly alters brain anatomy and function. Some believe medication is the best treatment, others think patients who hear voices should be allowed to make peace with those voices.
- It's important to note that the people hear *real* voices of *real* people. They aren't pretending —they hear them as much as I hear voices of my parents on the phone, flatmates when they're home.
- We have a poor understanding of all medicine in general, but particularly of mental disease. The same patient seeing multiple psychiatrists throughout the day can end up with different diagnoses.
- All mental diseases are on a continuum. All of us, myself included, exhibit small and hard-to-notice symptoms ourselves—anxiety, unfounded suspicion and fear, and more, and its up to both us and the doctors we visit to determine when it crosses some arbitrary line that means we are no longer considered "normal" and have "gone insane".

"They're Frightening People" (Multiple Personality Disorder)

FLUMES = deep, narrow stream
FOSSICK = rummage, search through something

- It's terrifying and under appreciated how easy it is to construct false memories. In fact, 20-30% of the population readily construct rich, vivid, emotionally evocative memories that simply did not happen—with important consequences particularly for legal action. Many "treatments" that look to help victims draw traumatic experiences to the forefront of their memories instead create fictional ones, fucking up situations deeply.
- People construct memories in real time by analogy to what has happened before, and their future reconstructions are colored by what has happened since the event. This is a small glimpse of how two people can observe the same event and recall it very differently in the future, sometimes adding or omitting crucial or entirely fictional details, with grave consequences.

A short aside on politics:

Authoritarianism, Totalitarianism, Fascism: loosely defined methods of governments in descending order of complete and often tyrannical control by a single ruler. China is authoritarian, Germany pre-war was Totalitarian, and during war was fascist, which is a state characterized by constant military readiness and citizen militarism.

Capitalism, Socialism, Communism:

Capitalism is an economic system of operation (and increasingly political) diametrically opposed to communism, which is just socialism on steroids. It is all about competition, market forces, and births inequality as market forces reward different people to different extents based on what others determine the value of their contribution to be. It came about when Adam Smith and some others showed how trade and acting in your own self-interest could be restricted to align with everyone's benefit (eg. Comparative advantage).

Socialism is the opposite, where a distributed system—the free market—doesn't make decisions about the value of things, but instead one party—the government—does. It reduces inequality by having the "state" that is, the people, own the means of production—the land on which factories are built, factories and tools themselves, as well as the raw materials those factories work on—to give people a sense of ownership over their community. It includes no

private property, no inherited wealth, government fixed prices, free social services. Sweden has around 60% income tax for the middle class—as a *free market socialist state*. Ideas of redistributing wealth to reduce inequality have existed since Plato, Marx was the first to formalize them and suggest implementation.

There are trade-offs to both, but precedent shows that human nature makes socialism difficult to implement, often with disastrous consequences.

Classical capitalism was the original, free market theory that advocated 0 government intervention or regulation (they saw that tantamount to communism), until the great depression. Keynes advocated occasional government intervention (as we have today), and birthed the new mainstream theory, Keynesian economics, still far from communism. Socialism was the next step, where instead of complete public ownership of land, the government, who represents the people, owns many businesses and land.

<u>Important concepts to define:</u>

social spending: taking cash out of society and redistributing it for the welfare of the disadvantaged or poor, in the form of subsidized housing, healthcare, education, and more for the disabled, elderly, young, poor, sick, and more. It cal also come in the form of homeless shelters, food kitchens, counseling and therapy services, and more.

UBI: giving people guaranteed amount of money to get them started to look for jobs/ educate themselves without having to worry about food, water, shelter. Studies show overwhelmingly people use this money well, and it would come from higher taxes on the wealthy or dismantling of current welfare systems into one unified system.

social democracy: the current state of most of the world, where you have strong, competitive economies harboring innovation, with admittedly some inequality—often large amounts at times—but also institutions at place to prevent those worst off from dying and suffering; a true Keynesian implementation.

communism: a hard-left implementation of socialist ideals that basically denies any free markets and electoral democracies, and encourages the proletariat to rise up through violet revolution. China, for example, is a Maoist 'communist' country, but it adheres to free market capitalism in practice despite the title of the ruling party.

<u>Why did Marx dislike capitalism, and advocate socialism?</u>

He saw history as nothing but one class overthrowing the next, from feudal to slave to then capitalist societies, and saw communism as the ultimate end of the continual struggle. He saw socialism

- People need to feel connected to the fruits of their labour. Modern, assembly line capitalist optimising for production means people are dispensible cogs working on one piece of the full product, detached from their work.
- Profit is another word for exploitation, not reward for "ingenuity" on behalf of the bourgousie.
- society has become so productive not everyone is needed to work. Instead of calling it the pejorative term 'unemployed' it should be termed 'freedom', with the government distributing the goods produced to individuals so they can enjoy utopia.
- he acknowledges corruption will take place in any system, but capitalists sin is giving value to things that have no inherent value (money) and fostering competitive resentment, anxiety, conformism, materialism over true, utopia freedom.
- he is historically important because he was the first philosopher who's work demonstrably and quickly changed the world's action, behavior, and structure, at scale.

I truly can see the communist utopia he envisioned, and it is truly beautiful. It is sad that it is incompatible with human biology.

What is the modern's worlds take? What mixture have we settled on?

- The best approach, as with most things, is to find a middle ground, taking the best of both worlds. Use capitalist structures and methods to foster competition, social mobility, innovation, ambition and hard work, but also have regulations and social structures in place to ensure people don't starve, that problems that the market wouldn't otherwise solve (environment) are solved in the interest of all society. This is the kind of structure implemented in most places today, with some variation. The Nordic model favors more equality, less innovation, more regulation and welfare, but is still very much a capitalist free market, whereas the American model favors more innovation, less government regulation/welfare, and more inequality as a result.
- Why are 15% of academics Marxists when it empirically doesn't work? They suffer from a psychological bias where they prefer elegant, unified theories that are clearly planned rather than chaotic, patchwork free market forces which are the result of distributed action.
- Why can't people recognize this reality? As with most issues of politics, we want to tell stories, to find a tribe. This is a perfect avenue through which we can do exactly that. People pattern-match to extremes and make up stories—confabulate—if you increase social spending, we automatically become like Venezuela, things like this.
- Another problem is that political discussions can't be had scientifically, open-mindedly, and rationally, due to human nature. It's the same reason people often either believe nature OR nurture—either we're destined to be set on a particular path, or are born blank slates. We can't fully comprehend nuanced, complex, dry facts.
- Interesting to note that people often think climate denial is due to scientific illiteracy, when it's not. Most people who believe in climate change have no understanding of the science, and no capacity to, either. It's because they want to associate them selves on the ivory tower, elite and intelligent "team", or take the consensus position. This is the danger of making something that needs political action into a partisan issue.

The reason that so much debate about the efficacy of these systems exists, of course, because the economy is a complex, adaptive system. We cannot run experiments to know what works better, and can only use precedent to approximate controls. It's one school of economists, backed by research and math, against another, backed by equally valid evidence.

Some economists ("the Chicago School, led by Friedman") said the economy is too complicated to risk the government meddling with. Keynesian economics disagreed, but also suggested stagnation of output and inflation couldn't happen at the same time, which it did in the 1970s, suggesting the theory was incomplete, causing some to back the Chicago school and advocate deregulation thenceforth.

The "nordic model" refers to the extensive state welfare system, as well as strong unionization in the nordic countries. Labour unions in and of themselves are not socialist, but the agenda of workers unionizing for better rights against the minority is socialist. They also have mixed economies (part free, part planned, meaning in between capitalism and socialism), and so are further left than other western free markets.

The reasons the Nordic model works so well in Scandanavia, but wouldn't work in the US include: smaller population, less immigration, harder cultural work ethic, reduced spending on other countries and a huge sovereign wealth fund propelled by oil.

"*There Was Nothing There, But I Knew It Was a Cockerel" (Need for stories)*

- At the core of confabulation is cause-and-effect. Stories are just cause-and-effect with some emotional spikes—tales of how things work and came to be. Our brains are excellent at modeling physical cause-and-effect, they have evolved to, but there is no evolutionary incentive to instinctively make accurate models of nuanced arguments and faraway realities (like climate change).
- If the story someone tells is too coherent and self-consistent, be suspicious. No reality is pure and clean and elegant and without nuance or exception. Symptom of confabulation.
- Intuition is far more complex a computational machine than conscious logic—which we didn't do until a few hundred/thousand years ago. People can tell what movie certain sweat came from by smelling it—a horror or comedy. Chicken factories hire people to pattern-match male and female chicks with nearly 100% accuracy and no physiological differences —we're remarkably like real-life neural nets being trained with less data.
- We often get predictions right, but causes deeply wrong. We use intuition to get to prediction, a complex computational program, but then confabulate some simplistic—seemingly making sense—narrative to explain our decisions to both ourselves and others.
- When thinking backwards about events that happened years ago in our lives, we're no better at explain how we felt or why we did things than random guessing. We confabulate clean narratives that, as Jobs says, "make sense in hindsight", because of course, you can make anything "make sense in hindsight".
- Religious people are genuinely happier and less stressed than atheists because the chaos and inelegant complexity of reality is not as comforting as the elegant, simple narratives we tell ourselves through religion.

I Came of Exceptional Parents (Climate Change Denial)

AD HOMINEM = attacking a person or character rather than their argument

PUERILITY = immature, childish

- The ideas of left and right came from the revolutionaries sitting across the royalists in the French parliament hall at the helm of the revolution. People align with one or the other as if they're choosing a side in a video game, choosing a tribe, an identity, not thinking about which set of beliefs best describes messy reality. That level of thinking if far too nuanced and rational for human nature .
- Traits that lead to rational voting are curiosity, open-mindedness, humility. Not intelligence, which is why very smart people can hold very dumb beliefs.

APPROBATION = approval, acceptance, praise

- Often, people just have contrarian as part of their identity, and some twisted, subtle part of them craves attention and making people's jaws drop with their outrageous beliefs. With things like climate change denial, the arguments they make are almost recursive—you question one line of argument and the justification is another line of argument, equally unfounded, said with equal conviction.

Backwards and Forwards in the Slime (Holocause Denial, neo-Nazi)

AFFRONT = insult, offend

OEUVRE = work of art

- People selectively recognize evidence supporting their claim (confirmation bias), like the man recognizing the handles on the gas chamber doors, but not the bolts on the other side.
- Intelligent people are better than non-intelligent people at coming up with arguments to back their beliefs, but no better tat rationalizing why the other side thinks a certain way or holds those beliefs. In other words, intelligence only serves to make you more stubborn.

That One You Just Go "Eeerr" (Skepticism of para-psychology)

- Science is incomplete, and there is statistically significant evidence for things as outrageous as telepathy and psychic powers. In fact, there is better, reproducible, evidence for these things than most other similar incremental discoveries in science. Renowned scientists admit this. It's just that accepting experimental results here means rethinking all of science from the ground up, and so "outrageous results demand outrageous evidence". This shows that while these "woo-woo" theories are probably wrong, it also means many other incremental,

non-widely confirmed findings are also possibly wrong in the same way. It's just that anything of value or relevance is quickly checked several times, and so we can be sure *that* is right.
- It's important to understand that skeptics, including many scientists, are just as biased as the people they deem crazy. If you're unwilling to accept the possibility of telepathy in the face of *any* evidence, no matter how compelling, then you're definitionally close-minded and unscientific.

A short aside on the validity of most scientific studies: most *published* scientific studies are false. You might think 5% of all results we say are true are in fact false because of the arbitrary 0.05 choice, but it's more complex than that upon closer inspection. If you have 1000 hypotheses, the majority of which are false, say, 900, and you correctly identify most of the correct relationships (80% statistical power is optimistic). You miss 20% of the true relationships because of a small sample size or imprecise measuring instruments. Of the other 900 false relationships, given a p=0.05, 45 will come up as true incorrectly (false positive). And since journals rarely publish correct null findings, they comprise only 10-20% of all papers published. And so of all papers published, you have 80 true positives, 45 false positives, and 20 true negatives. In other words, 45/145, or about a third, of *published* results, are wrong.

Most important, relevant, studies, are right (because they are reproduced lots of times, null findings in replication studies are published, larger sample sizes are used, and more), like the link between smoking and cancer or cardiovascular disease. But for the vast majority of studies that investigate, say, the effect of an obscure gene or set of genes on an obscure disease in specific conditions, there are no replication studies and the sample size is often small. Another important fact is that when you try to replicate studies, most don't show significant results, and even the few that do are not as strong as the first ones. Often times trying to publish these replication results is difficult since they aren't sexy. This alludes to how we're very good at having advanced statistical measures for narrow problems, but still get most things wrong.

The statistical 'power' of a study is its ability to correctly identify false relationships. In reality, most studies' methods have a power of 20-40%, not 80%. Moreover, most studies in psychology, neuroscience, medicine having environments that are complex living systems, with everything not held exactly constant as you can do with physics or chemistry. This means that even 'landmark' cancer studies (that are published as positive results) are only replicable 10% of the time.

Often times, scientists 'p-hack' and collect data until it gives a significant p-value. Ultimately, the scientific method is not broken, but incentive structures are. These include:

- Journals not publishing null results (biasing scientists towards methods that will yield significance when there isn't any)
- Lack of large-scale academic collaboration leads to small sample sizes
- Replication studies not being published by journals
- Publishing unexpected or awe-inspiring results is easier and leads to more citations (decreasing proportion of true negative to true positive realities, leading to more false positives and a larger fraction of published results being false)

Admittedly, people are acknowledging these problems and working to rethink the structure of science to change incentives and get published results to be right more often. More replication studies are being done and published, journals for negative results only are being started, organizations/journals are starting to promise publications if the method and hypothesis are interesting and robust enough regardless of outcome. But science is large and prone to human biases, and so don't count on this scaling anytime soon.

It's interesting to note that even trying out best to get at the truth means we're wrong most of the time. Imagine how often we're wrong when we try and glean truth from

observation, anecdote, and emotion in the way that humans normally do. It's no wonder that most people get most things wrong most of the time.

Epilogue: The Hero-Maker (on the importance of narratives in belief)

- Inevitably, we hold beliefs that put us, or our tribe, at the centre of the universe, and are particularly easy prey to binary, us vs them, black-and-white, hero-and-villain beliefs. When we hear a story that is a temperamental and philosophical match for us, it becomes part of our identity, and we fix our belief and change explanations and logic to match. This is human psychology, and not much can be done to combat it other than acknowledge these biases in our daily life, and practice calling them out.
- The only things we know are facts and data, in the process of interpreting and explaining them to form a theory of the world do we push and squeeze the data through our biased lenses, and end up with inaccurate descriptions of reality, incorrect narratives threading through all the disparate—and individually, correct—data points.

Age of Ambition: Chasing Fortune, Truth, and Faith in The New China

Prologue

PERCEPTUAL = relating to the senses and perception
PLUTOCRAT = a person deriving power from wealth
GALE = storm, tempest
SCRIPTURE = sacred text
RIVEN = torn apart, split

A note on writing: giving an honest opinion on biases someone in your position is likely to have, and how temptations you've faced succumbing to these makes it clearer that you're at stage 2 consciousness and makes you seem more reliable and objective to the reader.

Unfettered

RAMROD = (of posture) rigid and straight / (of an effort) bulldozing and forceful
JUG EARS = dumbo ears that stick out
IMPERIAL = royal, monarchal, to do with an empire
FLAGRANT = blatant, glaring
CONTRAVENE = break, breach (a law or order)
CIRCUMSCRIBED = restrict, limit
SHANTY = shack, hut
MARTIAL = military, to do with war

Testament to how bad we are at understanding statistics, and falling prey to narrative: almost double the people were killed in Mao's "Great Leap Forward" than in WW1, yet the former is going to go down as one of the world' most tragic feats—perhaps because those killed in the GLF were "only" Chinese, or because it wasn't as violent or entertaining a death—or perhaps just culturally because I've been raised in Western culture I've been surrounded by those who are biased to remembering tragedies in *their* culture because they both relate and understand them better.

Taiwan was where the losers of the 1949 Civil War (the Nationalist Party, called the "Republic of China", who lost to CCP), went on 'exile', causing large cultural conflict and enmity between the island and the parent nation.

The Call

MISSIONARY = religious campaigner, crusader, preacher

TRAMMEL = restraints, shackles
WRY = ironic, sarcastic

Two important phases under Mao were the Great Leap Forward and the Cultural Revolution. The GLF was Mao's attempt to catapult China into an industrialized economy by mimicking the USSR's '5 year plan', by strong centralization causing upping exports of things like steel and grain—the way it was executed led to individual-produced (shitty) steel and grain shortages, killing millions. He tried to further fan the flames by hoping that you could "persuade and inspire" the economy into greater growth. Then the Cultural Revolution was an attempt to reinvent China by purging all capitalist and western influence, and used as an excuse to vilify his enemies, demolish buildings and art.

After these abysmal failures, the government instituted the Beijing Spring to appease the masses, making some concessions that would fall under democracy and free-market capitalism. Dang Xiaoping also revamped the economy into a capitalist society in all-but-name (allowing large private enterprise, making SEZs). These reforms, alongside huge populations now in the cities where factories are located, paved the way for China to take over the world's manufacturing business.

On this note—how and why did so many people move to cities? China is trying to actively incentive this now, almost by trying to take farmers' land—to create more consumer demand internally since people in the countryside are more self-sufficient and don't consume the products of the manufacturing economy (construction, electronics, entertainment, consumables, etc.)

It's unclear whether China will keep their manufacturing monopoly—it sows the seeds of its own destruction as more people work those jobs and expect a middle class life, as automation obviates more and more of them, it becomes harder to justify a Chinese factory if you're Apple, compared to either one in Cambodia, or one back home (automated).

Interesting to note how Mao is remembered so much because he consciously made sure to spread propaganda, have everyone have a copy of his book, as well as because he's infamous for indirectly killing tens fo millions.

Baptized Civilisation

The move to an industrialised, manufacturing economy seems to have come about 1) because automation obviated large amounts of rural workers 2) because the government loosened the communist grip, allowing a people to want to focus on individual success 3) which led the way to a more individualist thinking that draws people to cities 4) because the government incentivized the mass migration to cities to spur demand for increasing manufacturing internally.

Interesting to consider the geographic origins of culture—people speculate that Chinese culture is more communist in nature because of the nature of farming that was borne out of geography that meant communities had to forge tight social bonds to survive, whereas Greek communities farmed in a way that was more individualist, centre around trading.

As the industrialized economy grew, so did western ideas of love as people wanted to do away with arranged marriage. Be

To succeed in a unique geographic location, it depends on the problem/industry, sure, but there are lots of cultural nuances you are subconsciously aware of that inform your decision making—Gong Haiyan knew that Chinese people, at bars, don't go to drink and chat up strangers; that's just not possible in a culture all about collectivism and reserve, instead, they all look down at their phones and occasionally chat. She knew that dating was always aimed at trying to get married as opposed to for the fun of it, and so made a site specifically optimizing for helping bachelors in this new age get married. Marriage rate for women is 98% in China, around 51% in the USA.

Also interesting to note the subtle ways in which culture works—the one child policy actually served as mass sex-ed, making way for female autonomy and loosening stigma around female sexual gratification.

questions:

- how does large infrastructure change come about? What makes it possible? How the hell did this country go from sub-saharan farmers to 50% of world manufacturing and cutting edge AI research in a few quick decades?

- Rapid, decisive cultural intervention of the type that is only possible in an authoritarian state, as well as a culture of compliance and obedience by the masses. The price you pay for lifting hundreds of millions out of poverty is human rights violations, stomping on public will, corruption as a result of opacity, and small amounts of deaths due to (public works) projects being done poorly. Because of human nature, if you want to move fast at scale, these are the concessions you have to make. Whether that's "right" or "wrong" seems contextual—maybe right when people are starving, but when everyone (as is happening soon) is living with the necessities in life, and ballooning into the middle class, maybe sacrificing individuals doesn't measure up to the benefit gained (a marginally better life for people living in the middle-class already)—makes me question the sustainability of the government?

- Chinese culture seems particularly prone to narrative psychology faults, and susceptible to dogma, perhaps because everything is tailored for the masses and so since many things don't make complete sense to the individual, there are so many people that you just learn to accept things at face value—and to do away with the innate cognitive dissonance, accept the narrative that makes most sense (the one fed to you, often by the CCP). A corollary is that they tend to think binarily—either deifying or spitting on other people (Indians are thought of as vermin, and Westerners as gods).

Insights:

- Many ordinary Chinese people seem quite naive about what it takes to succeed. They work *very* hard, but don't really know what real success looks like, or what it takes to get there. They seem to be aspiring to be upper middle class, without real ambition to 'take over the world'—perhaps why Michael Zhang seemed so in awe when I told him, unblinkingly, that I wanted to go down in history—that level of ambition is arrogant and impossible in China, but achievable and encouraged in the US.

- Important to viscerally understand the difference in culture. People propose on second dates, and there are classes for learning to socialize for the masses. In some ways, it's less pretentious than western culture, and in other ways, more.

<u>Deep Work, by Cal Newport</u>

—WHY deep work is increasingly important—

Every few months, Bill Gates isolates himself in a rural cottage to do nothing but "read and think big thoughts". Schedule time in which you do nothing but think big, grapple with hypotheticals, conjecture ideas bordering on science fiction, because, then, you might find one worth acting on.

Newport argues that we're undergoing an economic restructuring, where automation will rapidly be able to replace low-skilled workers and mindless jobs that are composed mostly of "shallow work". In this new economy, the successful will fall into a few different categories, three important ones of which are:

1. VCs. They pay for technology to do a job, and reap all the rewards without any labour.

2. Those who are the best at what they do. As technology makes access to labour easier, everyone will be able to found, and will seek out, the very best and nothing less.

3. Those that can work well with technology. In other words, those that can quickly learn a new skill or role and execute harmoniously with the technology that they oversee to get a job done.

To be able to fall into brackets 2 or 3 requires the ability to master hard things quickly, which, in turn, definitionally requires deliberate practise (which hones your ability to isolate neuronal circuits to fire, causing increased myelination), a synonym for deep work. Thus, deep work will become increasingly valuable.

Deep work involves focusing on a single task with uninterrupted concentration. This minimises "attention residue" that goes hand in hand with jumping between multiple tasks in a single day, which reduces efficiency.

So why is shallow work so ubiquitous in massive companies? Surely it's in their interest to optimise for actual productivity. Yes, it is. Indeed, if this shallow work was visibly impacting their bottom line, they would quickly excise it.

- But enter the metric black hole—the fact that many behaviours that impede productivity are incredibly hard to detect. Take email timings, for example. To find out how much reading emails is impacting company output, you look at average reading speed, average email length, average response length, average time between receipt and response, and more. Lots of data and lots of calculations are needed for a reasonable approximation. And when one company did chug the data, they found that, in their case, they were paying as much for people to use their emails every *week* as they would be for an acquisition of a smaller company. As such, when people lack these metrics to guide their behaviour, they do what's easiest in the moment. Responding to internal instant messages and "urgent" emails is shallower and therefore easier (in the moment!) than deeply grappling with the wildly important tasks at hand.

- Busyness as a proxy for productivity: In some fields, like academia, you have relatively clear indicators of productivity, like citations, publications and an h-index. In office work, you don't. So, when many people lack these clear indicators, but want to make it clear that they're earning their keep, they go out of their way to do many things in a visible manner—responding to instant messages, sending out emails—often the opposite of what's most conducive to *actually creating value*.

- There seems to be a growing ideology that if it's to do with the internet and technology, it should be used (the any-benefit approach), that any technological is irrationally useful and should be adopted without weighing pros/cons (craftsman's approach). This is a cultural phenomenon that may also contribute to the ubiquity of shallow work in big companies—most shallow work is online fluff.

When defining goals, a useful imbalance to seek can be a goal that is easy to define, but difficult to execute (learning to breakdance, self-studying FM A-level). Most office works pursue goals that are the opposite (work to ensure strategic vision is optimally focused towards revenue growth).

Why deep work is meaningful:

- Neurology: There is growing evidence to indicate that what you choose to focus your attention on determines your happiness. By focusing intensely on your deep work, you leave the neutral and negative thoughts associated with shallow work (administrative tasks, gossip/office politics) forcibly out of the hypothalamus.

- Psychology: Through use of ESM, Stanford psychologists determined that people reportedly felt most content when engaged in the deepest work. This went against the grain of conventional wisdom, which suggests that relaxation equates to happiness, but it suggests that losing yourself in your focus is, in itself, intellectually rewarding.

- Philosophy: The ancient world had meaning because it was sacred, there was god. As empiricism took root, humans were quick to realise that there is only meaning in their lives if they imbue their activities with meaning, a gloomy thought. The deep work philosophy though, reminiscent of the craftsman, suggests that there is an inherent meaning to be found in the beauty of taking pride in your work, and that you're not just imbibing meaning *to* your work.

—HOW to go deep—

1. How to logistically integrate deep work into your life:

- Choose a depth philosophy and stick to it. Work bimodally (a few days or weeks in a row of monastic depth, followed by a day or two of complete [structured] downtime) or rhythmically, setting a few hours aside every day at the same time to ease yourself into depth.

- Ritualise this. Choose one place to work deeply, stick to it. Choose food that will keep you powered, things to do during breaks that will energise you. Repeat identically.

- Make grand gestures from time to time. Like Rowling spending a weekend at a historic hotel to isolate herself and finish a novel, or an entrepreneur taking a 30-hour round trip flight from NYC to Tokyo to work through a pitch in isolation. This injects motivation.

- Choose your professional goals clearly, and focus only on the *wildly important*. If it doesn't immediately contribute to your goal (lead measure), it isn't wildly important. For academics, this means aligning every breath and minute towards more high-quality publications.

- Don't break the streak—create momentum through cadence. Set up a calendar and add crosses for deep work hours, look to slowly increase rate and maintain streak over time.

- Create a shutdown ritual. Even on monastic days, you can't be working deeply for more than around 4-6 hours at a time. At the end, create a plan for finishing unfinished work, and go through the shutdown ritual to tell yourself—no more work thoughts for the day, and move onto structured, productive downtime.

2. How to improve your ability to resist distractions and focus deeply:

- Most people take breaks from distraction to focus deeply on their work. It should actually be the opposite. Consciously live thinking about something of the other, and let yourself do mindless things on rare occasions.

- Improve your ability to resist distractions by minimising the amount you switch stimuli—schedule internet blocks in advance day's schedule, and stick to those schedules rigorously. Don't necessarily reduce the amount of internet, just be deliberate in how you use it.

- Add Roosevelt dashes into your schedule. Get some external deadline/source of pressure to get your to perform at the limit of your cognitive capacity—learn to focus so intensely because the situation demands it.

- Schedule productive meditation—walking, working out, running—all with the sole intent on solving a clear, well-defined problem. Make sure to consciously avoid looping, and push yourself to actively make progress on the problem. This hones ability to concentrate and makes all-the-time productive.

- Use the rooms of the house memory palace technique to practise learning a deck of cards, this improves your ability to focus your attention. Other similarly cognitively demanding tasks done on a regular basis are similarly effective (like Jewish people transcribing religious texts regularly every morning).

- Actively embrace boredom to learn to avoid the urge to find stimuli, so that your thoughts both wander and stay on task.

3. Regulating a common distraction, social media:

- *Completely*, and absolutely, eliminate infotainment (Quora etc.)
- When deciding to cull social media/tools like LinkedIn etc., adopt a cynical craftsman's approach weighing the pros/cons of a tools use (where most cons take the form of subtle opportunity costs and act against your wildly important lead measures).
- Schedule a 'packing party' to determine which social media are actually useful —go two weeks without touching any, and think about which might have contributed "significant positive value" towards your lead measures.
- Schedule your downtime in advance to avoid slipping into semi-consciousness. This doesn't mean it has to be productive, but reading, going to shows/galleries, conversations, seeing friends, can all be more effective and meaningful in actively relaxing than semi-consciously browsing Netflix or YouTube.

4. Draining the shallows:

- As humans, we tend to vastly underestimate the amount of time spent on shallow work, or in semi-consciousness, so you have to schedule *every single minute*. Then, revamp this schedule throughout the day to be mindful of how you're using every second of the day.
- Quantify depth of each task by thinking about how long it would take to train a Westminster to execute the task, and when you have your day's list of wildly important actions that are all completely aligned with increasing the lead measure, do them in order of decreasing depth.
- Adopt fixed-schedule-productivity. Outline when you're going to work until in advance, and stick to it ruthlessly, using your shutdown ritual towards the end. You can then use the rest of the time for productive (scheduled) downtime activities.
- Cull your email lists so you rarely receive email lists.
- When sending cold emails, be specific about why *you* are relevant to *them*, and make it incredibly easy for them to respond, making next steps clear and simple.

<u>7 Lessons on Physics</u>

1. General Relativity
   - Comparable to Mozart's *Requiem,* or Da Vinci's *Mona Lisa*. A work of beautiful, deliberate, abstraction, one that you should learn to understand in your lifetime simply for its elegance.
   - Main point is that space is not something through which objects move. It is an object in itself, almost like a winding tortoise shell that curves and twists and winds, guiding objects to move through it, an object in itself.
   - Gauss wrote mathematics to describe 2D geometry, and then his student, Riemann, extended it to 3 dimensions. Everyone thought this mathematical description was a formal and necessary abstraction—useless. Then it perfectly described the structure of space as a three dimensional object.

2. Quantum Mechanics
   - The calculations predicting this were an accident. Planck used a mathematical trick (or so he thought at the time) modelling energy as quantised to find the electric field inside of a box at a high temperature. The ensuing formulae predicted the field exactly, making him wonder if quantisation was accurate description of reality.

- Quantum mechanics is a huge leap because it predicts how quanta behave very well (we just don't know why it works!). As such, the entirety of chemistry is born out of a single equation (Schrodinger equation telling us how electrons behave/exist).

- The problem with our understanding is that it only tells us how quanta interact, not what they fundamentally are. We can predict with good accuracy the behaviour of quanta, but still know almost nothing about what an electron *is* (we think it's a probability function in space).

3. The Architecture of the Cosmos

- Simply outlines how we know the universe is expanding.

4. Particle Physics

- These are simply excitations of their respective fields. We have quarks (hadrons), bosons (FC) and leptons (electrons, neutrinos). For example, photons are excitations of the EM field, and quarks/leptons are excitations of the Higgs field (they have mass). Since we see these particles as simultaneously be waves, you can think of the rapid acceleration of a planet/star causes it to wiggle the gravitational field around it, and those wiggles can be thought of as predicted "gravitons"—how changes in the field are propagated.

- Because each particle has a probability distribution spread across the whole universe, no plot of space can be truly "empty".

- Dark matter/energy are holes in the standard model, because we would've predicted them instead of observing them first if they weren't.

- Physicists hate the standard model (the equations governing the many "elementary" particles we have, borne out of QM, and governing 3/4 fundamental forces) because it seems un-elegant. But, perhaps, since it makes so many accurate predictions, we just view elegance the wrong way and our view on the matter will change with time.

5. Loop Quantum Gravity

- GR assumes continuous, curved space. QM assumes flat, quantised space. GR says singularities of radius 0 must exist. QM says they can't. GR implies determinism, where you can find out exact values of gravitational fields at any point. QM implies probabilistic space, where there is inherent physical uncertainty in all measurements (not due to instruments).

- When you're making predictions about tiny, tiny, lengths using QM, you get lots of infinities (or values close to that), and so to extract your answer values, you have to "renormalise" by adding and subtracting values, which seems to somehow give correct answers.

- They can't both be right, but seem to. This heralds a huge opportunity for a grand theory of physics, just as special relativity was borne out of investigating inconsistencies between EM/mechanics, and electromagnetism was borne out of understanding subtle inconsistencies between our theory of electric and magnetic fields.

- Mainly posits that physics space is quantised in tiny, tiny "loops" or "rings".

- Consequences include the fact that time is an emergent property of this microscopic chaos of fragmented space, and doesn't really "exist", since it's only a comparative concept between different quanta of space. This happens because the unified equations don't have time as a variable, and thus the behaviour of space is independent of time.

- How do we test this? If true, black holes aren't matter collapsing to an infinitesimal singularity, but a quanta of space, where quantum effects push outward with the same force as gravity, with clumps of this incredibly dense, unstable new form of matter being called "Planck stars". When you chug through the math, LQG predicts that black holes are really Planck stars exploding outwards at an impossibly slow relativistic rate, making them seem to have near-

eternal life spans. We hope to observe high energy rays emitted by these Planck star explosions.

- LQG implies that the universal expansion is similar; it could be a macro-plank-star exploding out after collapsing in—thus providing a cosmological background prediction, too.

6. Thermodynamics

- Time is only meaningful when heat exists. Otherwise, all motion can take place backwards.
- Macro, top-down approaches like the ideal gas equations are approximations because, although we know how individual particles behave (not quantum on that scale), computing their individual motion would require more computing power than exists, by a long shot.
- Remember the in science, we do not measure everything about the states of objects. We measure specific *properties*, and then predict how those *properties* will change over time. This does not tell us about the actual objects themselves (which have far more information to them)—we just assume the properties not measured stay the same.
- Thermal science, when examined closely, brings up a lot of questions of philosophy.

Paul Graham Insights

The Lesson to Unlearn: Our education system is centered around preparing or tests, in other words, learning to game the system. Graham believes startups are good because incentives are aligned—you only win if you make a great product that users want. I argue that great products aren't this binary—often "gaming the system" plays a crucial part in getting funding or distribution that pushes you from scale adoption to fizzling out. Even so, its incentives are aligned better than most jobs and industries. People so ubiquitously believe that gaming the system is associated with real work because that's how you advanced in the metric-black-hole-riddled 20th century oligopolic society. **TAKEAWAY: startups are good because success means you're unambiguously adding value.**

The Bus Ticket Theory of Genius: The capacity to undergo failure at a rate needed to produce great work is not a product of infinite diligence, but infinite curiosity. He believes genius is merely "aimless, but obsessive, curiosity about things that happen to end up mattering". You cannot go 0 to 1 through discipline alone. **TAKEAWAY: Go very deep interests that matter, but not *because* they matter. That way you're the right founder for any problems you spot.**

The Refragmentation: The reason America seems divided today is more a reflection of the natural state of things (c. 19th century) than a novel way of the world. The 20th century US was one tightly knit by the twin threads of war and oligopoly. The latter led to bland products with little improvement over time because of little competition (which governments didn't want interfering with war—think Leuna and Nazis). So war led to the rise of big business, and technology was its downfall (eg by making supply chains feasibly efficient, so people benefitted from pros of modularity but not cons of miscommunication).

The whole point of getting a college degree was to become a "working professional" capable of doing management so you *wouldn't have to do menial tasks* like Carnegie did when starting up. Big business controlled all the distribution and so startups stayed small. Due to technology, markets went global and new startups had easy access to consumers through television and the internet. Size became a liability as pace of technical innovation accelerated. Then as politicians saw the incoming change, policy changes like Carter's "deregulation" made innovation from small businesses easier. As companies became smaller and employees began

moving between industries, salaries went towards market price for an individual—which meant they diverged between people. This was inevitably accompanied by a social fragmentation causing the social differences in philosophy and way of life between people we see today.

Graham sees economic inequality (even increasing amounts of it) an inevitable consequence (and indeed, the natural state of things in a free market) of technological development (leverage increases over time as technology matures—the same amount of innovation in 1800 generated less value than it does with computers today, and thus made less millionaires). But this doesn't mean the rich live well and everyone suffers—as Pinker shows, you can have the incentives of inequality while providing an objectively good quality of life for everyone. **TAKEAWAY: Why are startups "hot shit" right now? MOAT in product dev much lower, MOAT in distribution much lower, lack of market saturation with technology—this amount of social mobility is unprecedented. Generally, though, in times of innovation, inequality of this sort is the norm, and only war made corporate America seem viable. That uniformity is not the normal state of things in any innovative society.**

Do Things That Don't Scale: Making a startup succeed is in fact less about focusing on a problem and more about being loosely attached to whatever problem you currently think needs solved, as well as aggressive user acquisition (think about the Collison installation—was pc worried that *that* wasn't the best use of his time and talents?) Writing code in your room and feeling great about wrangling technical challenges is easier, more measurable and satisfying than getting rejected by strangers and asking yourself tough, honest questions. So don't fall into that trap. Airbnb went door to door in NYC recruiting users—this initial fragility is not unique to them (think about *Great People*). Pinterest founders went to design conferences to forcefully recruit users. Going out of your way to delight customers (eg hand-written thank-you notes) doesn't scale, but it *helps you scale* as word of mouth matters, and experience is part of product. **TAKEAWAY: The product/company test is a vector—not just the technology at any given moment, but sales/user acquisition/experience is something you can and must be creative about. It's the yang to the R&D ying that pulls in funding. It's part of the test.**

How to Get Startup Ideas: The best ideas are organic, stemming from problems the founders had, but also were well positioned to do something to solve. Thus, startup ideas are less about exploring, and more about noticing (think Admeeted). If you were ported back to 1980, there are things that would annoy you that don't exist because you took them for granted. In some sense, there are similar things that someone from 2050 would say about today. Find those by questioning everything around you, and particularly things that annoy you in your field of interest/specialization. Competition never kills startups, but you need to have an insight others are missing. Make sure not to be scared away by things that seem complicated and require outside knowledge (like Stripe made sure not to do when identifying the payments problem). **TAKEAWAY: Start noticing things (gaps, anomalies, irritations) more everyday, especially in your area of expertise. Set aside time for this, if necessary.**

A Word to the Resourceful: Successful founders understand feedback from users and investors objectively, as opposed to trying to fit it into an existing model. They don't attach themselves to ideas even if they've invested time in them. They traverse the idea space quickly and ruthlessly. **TAKEAWAY: Study cognitive biases and set aside a few weeks to try and eliminate them from your mental process.**

How to do What You Love: Prestige is especially powerful as a magnet when you're young—it causes you not to work on what you like, but what you'd *like to like*. You have to enjoy both the end (philosophically) and the process (most of the nitty-gritty)—how can this be reconciled with Cal Newport's idea of being able to love doing anything, like a craftsman? Parents are conservative because they share all the risk of your actions, but none of the reward. Be careful

about sticking to goalposts you determined a long time ago, lest you have a life chosen for you by a high school kid. **TAKEAWAYS: The process of shifting goalposts is called maturing, and it's to be welcomed, not denied. I must debate Newport vs Graham.**

The Anatomy of Determination: High-tech startup success is anatomically the same as making any business succeed (newspapers, railroads, hotels)—required hustle, but now also intelligence. Determination, he believes, is a mixture of will (being willing to die before getting off the treadmill), discipline (training on the treadmill every morning) and ambition (having the picture of the Olympic medal above your bed). **TAKEAWAY: Actively hone all these facets. Stick to your promises, grind through when you're tired, envision your dreams often.**

Relentlessly Resourceful: Someone resourceful is able to find the small number of ways past overwhelming external obstacles. Given the nature of starting companies, you must be good at doing this again and again to succeed (by not dying). **TAKEAWAY: This is the test. Know that, always.**

A Student's Guide to Startups: Undergrads will find it difficult to succeed with a startup because they have a back-up plan: being a student. The paradigm and incentive structure that class projects promote (all work contributes to grade, work harder you'll do better, there's an unambiguous mark scheme and someone who knows all the answers) the wrong attitude about how you solve problems in real life. A startup spends many months building stuff to throw away. Someone with "work experience" takes responsibility for their life and knows the reward is not Ferraris, but the ability to stop treading the employment wheel. And people with this experience know that you're rewarded for building things people want, not for working hard. **TAKEAWAY: Your gap year has shown you *viscerally* that startup success is about knowing users and obtaining distribution. During college. Act on it. Again and again.**

Why Smart People Have Bad Ideas: He believes it comes down to pursuing the first idea that comes to mind (sunk cost bias), being half-committed to starting a company (profits first, innovation later), and being afraid of competitors (that's almost never the bottleneck for growth). **TAKEAWAY: Learn to iterate ruthlessly on a problem space rather than fixate on a solution space, and this only comes with practice and experience. So go through it.**

What You'll Wish You'd Have Known: If sixteen year old Einstein or Shakespeare was in class with you, you'd never know they were bound for greatness, but that they were just another impressive teenager. When stuck choosing between two options, choose the one that preserves optionality, which is usually the harder one (math vs economics). Work hard on bleeding-edge projects related to your interests, and be the type of person where ideas can constantly and easily take roost, then act on these questions out of curiosity, not out of a desire to "make this your life's work". **TAKEAWAY: Centre your life around interesting questions you want answered in the next 2 years, as opposed to "life goals".**

How to Make Wealth: While "startup" is a new word, beaten to death, it's the same as the venture-backed trading voyages between Europe and Asia during the Roman Empire. In free markets, companies (and thus employees, units of those companies) get paid for the value they create. Graham claims that a smart hacker working at a small startup will create between 10-100x more output than the same hacker at a large company if they work much harder and are not constrained by corporate bullshit.

Founding a startup is merely compressing the stress of decades of work into a few years, hoping to reap commensurate rewards. Until a few centuries ago, the main sources of wealth were mines, slaves and serfs, land, and cattle, and the only ways to acquire these rapidly were by inheritance, marriage, conquest, or confiscation. Part of the allure of startups is

that this much social mobility—especially without knowing anyone—is unprecedented. Startups are just one way to get rich, except that they are probably the best way to *create wealth (value) while doing it.* In that sense, leverage and richness are aligned. For most of human history, this has not been the case.

If there is a tension between what the world needs and wants, often the "need" is really your projection of your value system. But sometimes, like in climate and education, there is a genuine conflict, and that's more of a problem solved through organizational restructuring, policy, and individual mindset than what a company can do (though you can certainly try, as Musk has).

It's better to start thinking of programmers as craftsman who can create wealth out of thin air. Every character typed is literally part of the finished product, and will usually contribute to revenue. It's the same as the woodworker.

The problem with large companies is that incentives are misaligned. Your value-add to the company can't be judged individually, so instead it's just averaged across all employees. This is a good deal for probably everyone but the top 5-10% performing employees, because they're all getting stability and "prestige". But the top few (engineers, for eg) generate 95% of the value to the company, and yet are being paid the same OOM as the others! What an asymmetry. Startups are merely vectors for these smart, hard-working people to get market value for their work. To get paid, you need to be able to measure your value-add (your *individual* contribution) and have it be very big (leverage).

Smallness gives measurability, and leverage comes from building technology: coming from the word *technique*, the way things are done. If you cut hair, you make money one customer at a time, but if you *change the way (business model or physical technology) hair is cut*, you impact millions of haircuts that happen everyday. That is leverage, and is how startups (we mean small technology companies) are different from other small businesses. This is true for Warby Parker as much as it is for Ayasdi. Even McDonalds, which isn't a traditional technology company, innovated in being the first one to prove that scale franchising could work, affecting the way thousands of other companies are approaching scaling.

The problem is that startup returns are not predictable: while the mean pay is 10-100x more, the median pay is zero (most startups go bust). When founding a startup, you either make zero or get rich. This is the conundrum.

A good measure for whether you have measurement & leverage is whether you're actively at risk of failure. Hedge fund managers care about Q1 returns, movie-stars about weekend box office, athletes about races won that year, and more. Disastrous, embarrassing failure is always an option for them. Individual software engineers at Google, lawyers at Orrick and quants at Jane Street are not in this situation to the same extent. The benefit of averaging is that your shortcomings are averaged, too. If all businesses were run this way, with people paid an exact fraction of the value they created, everyone would work much harder, as they do when running their own company.

"It's common for a startup to be developing a genuinely good product, take slightly too long to do it, run out of money, and have to shut down."

The reason politics is one level of abstraction up is because policy determines incentives. The entrepreneurs are the great individuals forging promising new paths and getting things into consumer's hands, but the politicians decide the shape and composition of the landscape through which the entrepreneurs must forge ahead in the first place. This is enormous, enormous leverage. Medieval Europe birthed the Renaissance and Enlightenment because politicians were smart enough to pass laws preventing feudal lords from crushing and swindling local merchants whenever they wanted. And this incentive structure birthed the entrepreneurial innovation that made waves in which we still frolic today. **TAKEAWAY: Startups are being paid to go through the pain of setting up distribution channels for things people want to buy, and using technology to get those channels to reach many people, fast.**

Sam Altman Insights

How Things Get Done: Think carefully about the two things that matter, and focus only on those. Going out of your way to meet and help smart people seems to conflict with working deeply, but it's an important exception. **TAKEAWAY: "Work" should consist of one or two goals, and all your energies should be focused on reaching them. It's that simple.**

Advice for Ambitious 19 Year Olds: Choose the path that lets you build cool stuff and hang around smart people. Keep your personal burn rate low and minimize commitments to be ready to notice any breakout ideas happening around you. Not an otherwise particularly enlightening piece.

What Happened to Innovation?: Major innovations make you think back and say "I can't even remember life without this" in the same way that I do with smartphones, even though I was around when Mom had a flip phone she rarely used. In 1990, only 2.5M people had access to the internet, and that's since grown 2000x in 30 years. Same with smartphones. But despite the Apollo mission having the computational power of a modern toothbrush, we haven't seen any major advances in the physical world of similar magnitude (aerospace, energy, biotech).

Incrementalism is less risky and compounds, and thus is useful, but has certain hard limitations on progress it can beget. Internet software is also way less regulated, with much less overhead than physical stuff, and therefore most innovative energy is focused there. He wants policy to incentive long-term thinking and reduce risk of hardware startups.

Premature Optimization: Startups often wrongly focus on incremental optimization that will, at best, lead to a 2-3x growth (email campaigns, A/B testing) when they need a 100x growth to survive. Focus on making shit people want, then optimize incrementally as you grow into the market.

Successful People: "Successful people create companies. More successful people create countries. The most successful people create religions." You can create a religion (belief system, way of processing the world) through speeches, books, and products. Jobs chose the latter, and built Apple.