Book Synopsis

from Craig Weightman

Stellar: A World Beyond Limits

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There has been only one revolutionary change period and that was from the hunter-gatherer society to the farmer-domesticator society, approximately 12,000 years ago. The invention of the written language and numbering systems transformed communications and the circulation of knowledge. With the birth of widespread technical knowledge and the concept of labor, societies changed from being reliant on nature and holistic thought to extractive and linearly driven toward growth.

Progress is the creation of knowledge, driven in two fundamental ways through trial and error:

1. Practical use in the form of technology
2. How we organize society

This book posits that we are on the edge of another revolutionary change in technology and society. It will be both rapid and completely upset our social structures. To describe this, the organization of the book is in three parts:

1. Understanding the history and roots of society so we can understand what is happening.
2. What the world could look like.
3. The options available to use and why we should choose carefully.

Overriding the entire discussion is the fact that this change has already started. Right now it is beyond the point where we can choose not to go through it. Our only choice is how do we deal with the coming change.

Part 1: Extraction

The hunter-gatherer society was part of the natural world where continual migration kept communities small and possessions few. Cooperation was prized over possessions and status. A holistic view of nature was required to survive.

Agriculture halted constant migration, produced vastly more food, changed people's diets, and greatly increased the size of society. It also introduced the concept that nature was an input to what you wanted to do - extraction. Other inputs - land, labor, and technology all helped radically change the structure of society.

With the introduction of commerce, the prime driver became, and remains, growth, while centralization became a key byproduct. As societies grew, needs grew and the guiding principle became 'grow or get outgrown' by another society. Extractive societies rewarded growth and overwhelmed all other surrounding societies. This gave rise to more organized forms of government, armies, economics and economic cycles. Driving societies was both the need to maximize growth (resulting in chaos) and restraining it enough to maintain stability. Too much growth and the society would tear itself apart and too much stability would mean other societies would outgrow them and take them over. Every society in history has risen and fallen based on how they handled this balance.

Society centralization was driven by the limitation of communication, transportation, and economies of scale. As these have improved we have become more of a global society.

The scarce and depleting nature of resources, both land and labor, meant value was based on both scarcity and growth, introducing the concept of inequality; be it labor, materials, or possessions.

Since humans are capable of an extraordinary and contradictory range of behaviors, emotions, and thoughts, this social structure rewarded those traits that tended to result in success. Since the extractive mind set sees the world in a linear fashion (do this to get that), the behaviors that were emphasized were ones that emphasized linear and reductive thinking and siloed results (short-term and isolated), discouraging things like 'global what-ifs'.

Extractive thinking has led to the division of labor and the creation of governments leading to hierarchies and stratification.

The entire extractive process and thought pattern not only gives us needed outputs, but also produces toxic ones we later have to deal with to maintain social stability - i.e. chemicals in public waterways. Today we have record outputs, but also environmental breakdowns and extreme weather events. Because of the combination of good and toxic outputs, extraction is inherently unstable and self-destructive over time.

Part 2: Stellar

An alternative to extraction already exists and is gaining force daily against extraction industries. This is solar and wind power, which is universally available, unlimited in scope, and basically free. Since energy drives all other sectors of the economy, this development is transformative. Because we have global communication and transportation, this development will play out, not in generations, but in years; upsetting all our industries and our entire social fabric in the process.

Already solar and wind power is cheaper to produce than coal, oil, and natural gas and has the added benefit of having no toxic outputs. The third leg of this powerhouse is battery technology, which - once built - also stores and discharges energy with no toxic outputs. The convergence of these three technologies - **s**olar, **w**ind, **b**attery - we call SWB.

Building the Stellar technology does require extractive input, but - once built - requires no further extraction to maintain and repair. The key to this capability is AI and robotic labor - also becoming available today. The cost curve to build these technologies is both low and provides power far beyond normal daily requirements today. Additionally, these products are better used in a distributed fashion - as opposed to the centralized utilities of today. This means they can be undertaken by smaller groups without involving large, bureaucratic organizations, as well as having energy for sale to outside demand, once completed. If the system is properly sized, long-term batteries are not a large problem.

It is technically possible today to supply SWB systems for the entire planet within 20 years, if that were our goal. Each new system will produce enough energy that entrepreneurs will be developing non-time related uses for this added energy - produced as a by product and at little to no added cost, i.e. charging EVs when energy is cheapest.

AI and robotics are seeing exponential growth in both their hardware and software technical improvement. We will call the convergence of AI and robotic systems AL (Artificial Labor).

With all these technologies coming together at the same time, systems built will soon be able to maintain themselves. The authors call this the ***"ignition point"*** - when a system no longer needs any extractive input to sustain itself.

Biotechnology - food, medicine, and other materials:

- Precision fermentation (PF) is a combination of biology and fermentation that allows "programming" of microorganisms to produce any complex molecule desired.
- Can be done at scale in an area materially smaller than that needed for animal agriculture, freeing up land now used for herding and farming.

Stellar technologies must be combined with completely new ownership models, as private/corporate ownership defeats the focus on individual rights and society ownership.

- While private ownership is needed to help build the Stellar World, some form of limited patent rights with sunset clauses clearly stated should be instituted.
- Open source AI programs fit into the same arena and, as they draw on citizen's knowledge and data to evolve - they truly do belong to the general public.

Opposition will come because the models of thought, emotion, and behaviors rewarded by extraction will no longer be an advantage, but often a liability.

- When key inputs are embodied within the system, there is little role for market capitalism (based on scarcity). or any other extractive economic model.
- The metrics we use to measure economic activity (salary, wealth, GDP, debt, productivity) will no longer serve any purpose.
- The role of a centralized government, in a world of decentralized, networked, Stellar systems having no toxic outputs will be massively reduced. Emphasis will move to local government.
- Many barriers societies erect to protect themselves or control their citizens will no longer be necessary.
- Ending the growth imperative, by itself, increases the stability of the society.
- Scarcity confers a value to greed, violence, and consumption that is no longer there. What will human nature be then?

Part 3: The Journey

The process of change - The economy is usually in a stable state where change is exceptionally difficult.

Drivers of change when the system becomes unstable or breaks down.

- Toxic outputs force change, i.e. environmental conditions, widespread death or disease.
- Technological convergence occurs, i.e. the combination of steel, pneumatic tires, and the combustion engine yielded cars and trucks.
- Product cost curves are entirely predictable and logarithmic, i.e. PV (photo voltaic) cells were first used in space because there were no alternatives, but they dropped in cost so much they have become the cheapest form of energy on the planet.

The point at which negative feedbacks to change break down and change becomes inevitable is called the "Rupture Point." At this time solar energy has passed the Rupture Point.

The S-curve towards adoption of new technologies is accompanied with a reverse S-curve of obsolescence for the technologies they replace. The old technologies tend toward zero, carrying their investors with them. The period from when the Rupture Point is reached to general adoption of the new technology is around 15 years.

What people fail to realize is that complex systems are self-organizing and adaptive - when something changes, everything else adapts to the change - speeding up the conversion.

New system states are fundamentally different from the old, with different attributes, i.e. a caterpillar is fundamentally different from a butterfly.

Mistakes and Chimeras

- Chimera: A compromised product, solution, or system that arises from extracting the future from a linear extension of the current mind set (extraction), i.e. the computer is simply a better typewriter. The emergence of a new energy system will create a cascade of changes that are unimaginable today.
- SWB is a distributed technology and totally scalable, i.e. anywhere can be an energy generator.
- Long-term battery storage is largely unnecessary if you over-build the SWB generating capacity. The additional energy is available or lost, but there is no added cost or savings.
- The concepts of ownership and property will have to be adjusted as the Stellar energy economy belongs to everyone.

Avoiding diversions.

- Understanding the root cause of our problems - the extractive mind set - is critical to addressing problems.
- If a problem is energy scarcity, and solar/wind is unlimited, do not use rationing or redistribution as a solution.
- Do not mistake the technique we use to reach our goal as the goal itself.
- Consensus is not possible and we should encourage independent action during our process. Most of our solutions will be 'bottom-up' and not 'top-down'.
- We have already reached the energy rupture point - going back is not an option.

The journey has begun. The challenge for humanity is how do we want to make this change?

What can we expect?

- A dual economy (both extractive and Stellar) over decades means the Stellar economies will out-compete the extractive economies, sector by sector and region by region and we will be wasting our time trying to save these extraction industries.
- The economies will follow the S-curve and reverse S-curve as they develop and decline.
- The extraction economy will fall into three parts.
    1. Legacy economy - continues until death
    2. Seed flow economy - the extractive past will be used to build (seed) the Stellar core until reaching the "ignition point" of that technology
    3. Output applications - the human effort and ingenuity needed during the transformation
- The 3rd part of the extractive economy is where choices around ownership can create a dangerous Chimera

- The economic system will experience the most immediate dislocation.
    - Economic metrics and signposts (GDP, inflation, trade) will not be able to differentiate between the flow of land, labor, and capital used as a seed for the new system.
    - Output for the Stellar economy will be at near-zero cost and managers will not understand this fact.

How might some of the mismatches play out?

- The journey from extraction to Stellar is hugely deflationary, because each unit of input produces far more output than expected.
    - As the costs of major inputs (AI, AL, energy) drop exponentially, the impact is deflationary.
    - Once in the Stellar World, outputs have zero cost and they are demonetized.
- This is a problem for the extraction part of the economy, because it relies on growth and inflation for investment. Debt is assumed with the belief that inflation will lower the future cost of money, but deflation increases its cost.
- Job losses due to robotic replacement will represent an increasing part of the social structure. Hard labor is not a requirement of the Stellar World.
    - The extractive toolkit (taxes, unemployment benefits, job training, etc.) will not be sufficient to solve this crisis.
    - A Stellar ownership model, where everyone owns a piece of the production systems, is increasingly critical at this point.
    - Due to the uneven pace of change, extraction tools like UBI (universal basic income) will be needed.
- Ultimately governments will be forced to print money
    - In the beginning this will be done to counter the deflationary forces in effect.
    - Monetary policies
        - Today money is printed to cover the difference between taxes and the government debt or to stimulate spending when entering a ‘downturn’ (print & burn).
        - Governments could also print money to help finance the Stellar energy system (print & build), reinforcing the public’s right to an ownership stake.
        - Printed money can also be used to support those impacted by job losses (print & pay).
        - During the transformation, fiat currencies will rapidly devalue and alternative means of exchange will emerge.
- In the Stellar World value is embodied in the production system, not as a ‘store of value’ like currency.
- Investors today face a period of extraordinary opportunity and very profound risk. The value of many companies is going to go to zero.
- Increasing inequality along the journey is unavoidable. Failing to address this inequality will be one of the main risks of the Stellar transformation. The need to protect people over jobs or industries cannot be overemphasized.

Everyone doesn’t need to move together

- All transformations start somewhere and we have already seen this change underway.
- Extraction leads to economies of scale (things get bigger), but Stellar technologies are modular and can work in all different scales. Small groups can decide for themselves and actively work toward their goals right now.
- The Stellar core of energy and automated labor (AL) can successfully drive economies at speed against extractive enterprises.
- There are no input constraints and no toxic outputs for Stellar economies to be concerned with.

Guiding Principles

1. Rethink - Question everything we thing we know.
2. Adapt
    - The decentralized, networked nature of the Stellar system is resilient, but the upheaval will be unprecedented.
    - Be open to new ideas. Fear of change can paralyze.
    - Overcoming incumbency will be the biggest obstacle.
3. Solve the right problems
    - The problems of extraction can be mitigated, but - because they are intrinsic to the system - they cannot be solved.
    - Band-aids play a role in preventing collapse during transition, but do not mistake them for solutions.
    - Protect people, not jobs, corporations, industries, or special interests. Mitigating job losses will be a primary function of government.

4. Prioritize
    - Energy under pins every economic activity and is the foundation for intelligence and labor in Stellar Worlds
    - Individuals and communities should be given priority to create their own systems.
    - Ownership rights around AI need to be resolved early on.
    - Open-source software must be a central tenet.
5. Harness extraction - Needed to build the Stellar World to “ignition point.”
6. Optimize with purpose - Different societies will have vastly different priorities and this is to be expected and encouraged.
7. Create Stellar nurseries - Allow many different regions to set up their own Stellar systems to allow for the highest creativity.
8. Align - Distributed communities, networked together with new forms of governance, ownership, and spatial structure will grow and organize themselves.
9. Let go
    - The key to success will be letting go of what helped us succeed in the extractive world.
    - Everything will have to be questioned, and much let go.