Academic Progress: An Outsider's Perspective

Why does academia move slowly? I spent some time talking to researchers about the current system. Below are the notes of an outsider peering in, trying to decipher why things are broken and how one might help fix it:

A conservative cultural feedback loop. People optimize the cultural reward system they're in. This is one of the reasons why Nigeria doesn't have 10X more successful startups. It isn't that they lack the IQ; it's that when you grow up in Africa you're told the best thing you can do is provide sustenance for your family. Not start the next Google. "Winning" means something relatively modest by global standards. You move at the cultural cadence set by your peers. And the academic cadence is (a) just not as speedy as Xiaomi's (b) very conservative. Over time, this becomes particularly pernicious with adverse selection. Anyone seriously adventurous just pursues another path.

It's bad practice to be openly ambitious. Californian startup culture *rewards* big thinking. Academia penalizes it. Publicly declaring a big bold goal ("We'll be the most prolific, hardest working cancer research lab in the world") is seen as wrong, especially for a young upstart. This isn't new. Even in industry, the patriarchy often rejects the bold, challenging generation. The difference is the reward function and feedback loop.

Hard to raise money. Imagine you were a startup founder and had to raise a seed round every 2 years. And your career is over if you go more than 5 years without raising a round. You probably wouldn't pursue VR in 2012.

No independent point system. In startups, the point system is revenue. Make giant amounts of it and you'll win. This is important because it allows for fast-moving outsiders to dethrone incumbents. The chairman of IBM may not like Steve Jobs challenging him. But his opinions don't matter: if Apple produces a product people want, it'll generate revenue. It will win the game. Academia has no revenue. The point system is the approval of the geriatric elite. In order to win you need your professor to like you. Academia is like Twitter, except you can only get Likes from verified accounts. And, importantly, verified accounts are run by old people who aggressively defend their status turf and *who can't lose their magic status*. Which brings us to tenure.

Tenure. Imagine you had a boss. And if your boss *really* liked you, they'd grant you a cheat code: infinite status and salary at the company. Forever. How would you spend your career? Would you be focused on innovating as much as possible, or would you spend your energy on making your boss like you? Progress often requires challenging the status quo. I'm not sure why you'd do that once tenure is being offered. Dangling infinite status in front of a young scientist is as immoral as offering JUUL to teenagers. It's un-naturally addictive and will cause even the most dedicated Einstein to misdirect their attention towards playing the game, instead of progressing science.

Hard to measure progress. Suppose you wanted to fix this problem and launch a new way to fund the best scientists. Not so simple! Academic projects take a long time. Scientists can go for 5 years with little to show for it until they suddenly discover CRISPR. That being said, its strikes me that this is *the* problem in science. Not curing cancer directly. Not extending human lifespan directly. Instead, work at a deeper layer: engineer a measurement system for short term lab progress. If we had that -- if we had a "scientific revenue" system, everything else would follow. Young "startup labs" would be able to prove themselves worthy of more funding with modest resources to bootstrap. We'd break the shackles of the existing hierarchy and unleash a new generation of ambitious, differently-styled thinking on our current set of problems. We built the Saturn 5 rocket. And the Internet. Assuredly with enough effort this problem can be solved, too. But how?

sci-rev, a form of "revenue" for the science world:

1. **New metrics.** What should we measure? Here's a problem: scientific advances take time. The final *outcome* may take years. In companies, the solution to problems with delayed output is a focus on *input* metrics ("how hard are you working?"). The significant "work unit" of a scientist is running an experiment. One notion of quality is what you *learn from an experiment*. The more information you can capture from a spin of the simulator, the faster you'll snap-to-grid. Imagine scientists submitting anonymized status updates before and after each experiment you run. Those updates are voted on by a crowd. What I'm describing here is very similar to Twitter. But here's the twist:
2. **New mods.** The way to drive change in science is by changing who the influencers are. Which accounts are "verified" to give "likes". Change that, and you'll change what the players optimize for. It'd be great to have a science funding model where the "professor" students are performing for is Stephen Wolfram. Or Jim Keller. Or even other young scientists themselves. A youthful generation performing for each other can yield nuclear energy: the average age of NASA's control room during Apollo's launch was 27.
3. **Bonus: Dirty metrics.** Keyboard strokes. Amount of communication. Location. Language. Assuredly *some* of these variables correlate to success. Which features are common amongst successful teams? Do they use Slack a lot? A little? Etc.

What should Pioneer do? I can't wait to read the comments on this piece, lambasting me for my naïveté in thinking we could solve this problem. But we will try. We must try. We could use help! I'd be very curious for any constructive criticism, ideas or generally jovial insights anyone has on this topic. And if you'd like to build this world with us at Pioneer, apply here: https://pioneer.app/about.

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