

SCIENCE IS AN ANARCHIC ENTERPRISE

HETERODOX LABS

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DEC 2024

If asked to describe science, most people would likely characterize it as rigid, rules-based, concrete, or perhaps even “truth-seeking.” From a young age, we’re all taught that the scientific method is a prescriptive track for understanding the natural world - the key to revealing the secrets of our universe.

I believe this is a fundamental misunderstanding of what science actually is. This narrow interpretation - that science is a mere algorithm - not only misrepresents science but also hinders its broader mission to advance knowledge. In a world currently plagued by stagnation in the hard sciences, we must reimagine science at its core and develop a vision for its future. A vision that frees us from our current intellectual doldrums.

THE TRUE NATURE OF SCIENCE:

Science, when flourishing naturally, thus achieving its goals, and advancing us towards the future, is fundamentally anarchic. Consider the history of scientific progress: this is not a tale of institutions and laboratories slowly, methodically examining the material world through docile incremental pursuits. Rather, in many of these periods throughout the history of science, where paradigm-shifting progress was achieved, standards reflective of those now employed in the modern laboratory were not upheld. Science is indeed a story of radical individuals, often outsiders and provocateurs, advancing creative and counter-inductive ideas. Science is more akin to art than algorithm. It is important to note my words are largely inspired by the work of Austrian Philosopher of Science Paul Feyerabend, who among many accomplishments, wrote a fascinating book called *Against Method*. In AM, Feyerabend argued there is no single “scientific method” that guarantees progress. Instead, science advances through a diverse interplay of creative ideas, competing methodologies, and even contradictions. Feyerabend coined the term “epistemological anarchy” to describe this vision of science, where “anything goes” in the quest for knowledge. My goal is to take Feyerabend’s words seriously, and further pragmatically apply such ideas to a new model of what science should *look like*.

LOOKING BACK:

In *Against Method*, Feyerabend primarily examines the case of Galileo - a canonical example of scientific progress for many. Galileo completely changed our perspective of the cosmos through gaining widespread acceptance of the Heliocentric Model of the Solar System, defeating the prevailing Geocentric views held at the time. Most of us, including myself for many years, were led to believe that Galileo was merely a humble scientist, who achieved progress through rigorous experimentation and verifiable evidence. In popular dialogue, Galileo is looked at as a ‘man of science’ who rebelled against the hoopy doopy church, which merely wished to maintain their human-centric understanding of the universe. Feyerabend clearly articulates that this is a nonsensical interpretation of this moment in history. Galileo was actually a rather controversial, political-like figure at his time, a bit of a loud-mouth so-to-speak. Galileo wrote many books, and was an excellent provocateur. Galileo’s *Dialogues* were rather dramatic works featuring characters who represented different sides of the debate for Heliocentrism. Salviati, the expert (Galileo), Sagredo, the undecided observer, and Simplicio, the defender of geocentrism, whom Galileo portrayed as a simpleton. Galileo’s skill as a writer and debater played a major role in his success, as much as his scientific observations did. Furthermore, the geocentric model of the time was not a delusion of religious zealots; it was a highly sophisticated mathematical system developed by Ptolemy. Galileo’s victory was not inevitable based on evidence alone, but rather on his ability to persuade and provoke.

Thus, we find an example of a lone individual, with imperfect methodology, defeating a seemingly unconquerable institution through the deployment of good rhetoric + argumentation rather than methodologically rigid practices. Taking this further, Galileo wouldn’t even license his advanced improvements of the telescope through which he made his observations - this would be the modern equivalent of a highly controversial public figure, discovering groundbreaking physics beyond our wildest imaginations through the use of a revolutionary new quantum device - yet refused to grant anybody access to seeing such results using their technology.

ON THE FUTURE:

Currently, science is Dogmatic, Closed and Highly Centralized. There have been many noble attempts to modify our existing science institutions and laboratories - folks duly infiltrating the ranks and seeking to move mountains. However, this approach is ineffective. Rather than forcing existing labs to adopt new ways of thinking, we must build a new frontier for science. We should think very specifically about what this new frontier should look like and mobilize this effort from the ground-up. Our future of science should be Radical, Open, and Decentralized - and these conditions are far more amenable to extensive progress, compared to what now exists in the prevailing culture of science.

Radical:

In the current culture of science, fringe ideas are not welcome. Inside any formal lab, if one were to bring forth questions of UFOs, Mysticism, Aliens, 'Theories of Everything', alternative medicine, and more, then they would certainly be ridiculed, and perhaps even experience systematic persecution. This is both unacceptable and detrimental to science's ability to find new trees which may bear fruit. The problem is not that no more fruit exists on the trees of science - it is that we have not been allowed to explore new gardens. We must embrace the sort of 'Epistemological Anarchy' that Feyerabend advocates for, where 'anything goes'. In embracing the Radical, perhaps uncomfortable areas of scientific inquiry, science can start to break ground in new territory and at the very least these fringe ideas can serve a useful purpose in clashing with our existing models/interpretations, perhaps even strengthening them in the process. Through the fringe we can find gaps in our thinking and advance on wholly new frontiers - most of which have been locked down due to deranged institutional incentives, and psychosocial barriers.

Methodological Pluralism:

Not only are fringe ideas not welcome, diverse methodology is also very much rejected. In *Against Method*, Feyerabend introduces the concept of methodological pluralism. Over the years science has isolated itself from all other intellectual spheres; namely the humanities. We can unlock many new and fascinating insights by bringing the philosophers into a room with the physicists, the historians with the biologists, the sociologists and the chemists.

Open-Source:

Expanding upon new methodological paths - it is time for science to embrace the open-source philosophy that the software industry has so greatly benefited from. Labs collaborating with one another, sharing data, anecdotes, models and allowing for outside visibility + contribution not only will accelerate research progress, but it will also strengthen public trust in science which has been completely lost in recent decades. The existing institutional grant-based incentive structure fueling most labs has restricted researchers' ability to open-source their raw materials. This leaves us with the whole of scientific output, being highly abstract, jargon filled word documents published in pay-walled journals. I do believe there are sometimes exceptions to the open-source philosophy, however there is much room for adoption of such practices in science.

Decentralization:

Considering all the aforementioned properties of the future, this leaves us with one final trait; Decentralization. I believe the future of science will largely be driven by citizen research labs, which exist autonomously beyond the confines of our existing, formal research institutions. We must construct a new frontier from the ground up - not only with renewed epistemology + culture, but also tools and infrastructure. Given the right toolset, and access to resources, citizen-driven labs can emerge, and thus provide researchers of all backgrounds; PhD or not, a self-sufficient model for research. Given self-sufficiency and decentralization, citizen-researchers no longer have to conform to the deranged incentives prevalent in our institutions which enforce incrementality and bureaucracy.

New models, methods, and areas of inquiry can be experimented with. A ripe new frontier can be birthed. Once self-sufficiency is achieved, our world of science will look much different. Highly regulated, and cost-intensive research pursuits will remain within our formal institutions, as these institutions will not simply be toppled entirely - however, most advancements in basic science will be achieved by citizen-driven labs and small, nimble, startups.

In the future, perhaps new advancements in chemistry will be made by passionate hobbyist chemists with a day-job. Perhaps advancements in alternative medicine will be made by mothers in Idaho, supported by interested and like-minded friends. Perhaps theories of everything will be proposed by high-schoolers with an insatiable appetite for mathematics.

For too long, science has been shackled in the dungeon of our institutions, and it is time for liberation. The path to freedom may be long, and winding, perhaps even treacherous - however, a wonderful new frontier awaits us, with many discoveries to be made. The first step in embarking on this journey is for us to utter the forbidden phrase; "*Science is an anarchic enterprise.*"